सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

NCVET
कौशल गुणवत्ता प्रगति

INDIA SEMICONDUCTOR ECOSYSTEM WORKFORCE DEVELOPMENT

STRATEGY REPORT
2025

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सत्यमेव जयते

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FOREWORD

It is with immense pride that I present the India Semiconductor Workforce Development Strategy Report, a pivotal document designed to cultivate a strong talent ecosystem for one of the most crucial industries of the 21st century. As India advances its vision of becoming a global leader in the semiconductor sector, this report highlights our unwavering commitment to developing a skilled workforce that aligns with the evolving needs of this dynamic industry.

Semiconductors are the backbone of technological progress, driving innovations across various domains—from computing and communications to healthcare and energy. Building a resilient, future-ready workforce is critical for establishing India as a key hub for semiconductor manufacturing, design, and research. This strategy outlines targeted initiatives for skilling, upskilling, and reskilling, aimed at bridging the gap between academia and industry.

The report emphasizes enhancing capabilities in essential areas such as Electronic Design Automation (EDA), fabrication, and cleanroom technologies. It also delves into integrating India's semiconductor sector within the broader Electronics System Design and Manufacturing (ESDM) value chain, highlighting the significance of cross-sector collaborations—spanning electronics, manufacturing, research, and technology—to foster growth and innovation in the semiconductor ecosystem.

To support these initiatives, specialized skilling programs are being developed, with courses offered by premier institutions such as the IITs, IISc., and AICTE-affiliated organizations. The report outlines strategies for capacity building in the semiconductor value chain, focusing on creating industry-aligned qualifications and courses, enhancing educational and training infrastructure, and establishing a globally competitive semiconductor ecosystem.

Furthermore, the report underscores the importance of academia-industry partnerships, increased R&D investments, and robust policy frameworks to drive innovation and ensure the sustainability of semiconductor manufacturing in India. It offers key actionable recommendations to position India as a global hub for semiconductor manufacturing and design.

I extend my deepest gratitude to all contributors who have provided their expertise and insights in shaping this comprehensive strategy. Their collective efforts reflect our shared commitment to empowering India's workforce and serve as a cornerstone for the nation's semiconductor revolution.

I call upon all stakeholders to collaborate in the successful implementation of this strategy. Together, we can strengthen India's workforce, solidify our global standing in the semiconductor industry, and propel the nation towards a future marked by innovation and resilience.

Prof. T. G. Sitharam

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सत्यमेव जयते

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GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
AND ENTREPRENEURSHIP

MESSAGE

The global semiconductor industry is the cornerstone of modern innovation, propelling advancements across critical sectors such as electronics, automotive, healthcare, and telecommunications. As a trusted and reliable partner in the global semiconductor ecosystem, India recognizes its responsibility and potential to emerge as a leader in semiconductor manufacturing and design. This ambition is fuelled by the ongoing technological revolution, driven by breakthroughs in Artificial Intelligence (AI), the Internet of Things (IoT), and a shift towards design-centric innovation.

India's demographic advantage, with one of the youngest workforces in the world, offers an unparalleled opportunity to become the global hub for semiconductor talent. However, this vision can only be achieved by equipping our youth with the right skills and creating pathways for continuous learning and professional growth. The National Credit Framework (NCrF), as envisioned in the National Education Policy (NEP) 2020, can play a pivotal role in aligning the critical skill sets, that of highly skilled design and engineering talent and skilled semiconductor technicians by facilitating the integration of vocational and academic education. This alignment ensures that learners can seamlessly progress through structured pathways, gaining the competencies required to thrive in advanced roles across all the sub-segments in the semiconductor value chains and user industries.

The India Semiconductor Workforce Development Strategy Report explores India's strategy for workforce development within the semiconductor sector and presents the key recommendations for scaling up the skilling efforts in this sector.

MSDE is committed to empowering India's youth with the skills needed to excel in the semiconductor domain. We believe this report will serve as a good reference for policymakers, educators, and industry leaders, guiding collaborative efforts to shape the future of India's semiconductor industry.

(Atul Kumar Tiwari)

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आज़ादी का अमृत महोत्सव

PREFACE

The semiconductor industry forms the backbone of the modern technological era, powering advancements across various domains such as information technology, telecommunications, healthcare, automotive, and energy. As the Fourth Industrial Revolution unfolds, technologies like 5G, Artificial Intelligence (AI), Internet of Things (IoT), autonomous vehicles, and Industry 4.0 rely heavily on semiconductors, driving unprecedented demand worldwide. The global semiconductor industry, valued at approximately $556 billion in 2021, is projected to reach $1 trillion by 2030, underscoring its critical importance to economic growth and innovation. However, the industry faces significant challenges, including supply chain vulnerabilities exacerbated by the COVID-19 pandemic, geopolitical tensions, and the rising complexity of semiconductor manufacturing processes. These factors have highlighted the need for nations to build resilient and self-sufficient semiconductor ecosystems to secure their technological futures.

India, as one of the fastest-growing digital economies, represents a significant opportunity for the semiconductor industry. With its burgeoning demand for electronics and emerging technologies, India's semiconductor market is expected to grow at a CAGR of 19% from $27 billion in 2021 to $64 billion by 2026. Recognizing this potential, the Government of India has launched the **Semicon India Program** with an outlay of ₹76,000 crore (approximately $10 billion), aimed at incentivizing semiconductor design, manufacturing, and research. India’s strengths lie in its vast pool of engineering talent and established capabilities in chip design, with over 20% of the world's semiconductor design engineers working for global giants like Intel, Qualcomm, and NVIDIA. However, the lack of domestic fabrication capabilities and dependency on imports for over 90% of its semiconductor needs poses a significant strategic challenge. Bridging this gap requires targeted investment, robust policies, and the development of a skilled workforce to transform India into a global hub for semiconductors.

This report explores the multifaceted dimensions of the semiconductor value chain, offering actionable recommendations to position India as a leader in this high-stakes industry. The report comprehensively examines the semiconductor value chain, encompassing research and development, design, fabrication, assembly, testing, and packaging. It highlights India's strengths in design and software capabilities while addressing gaps in fabrication and packaging infrastructure. Furthermore, it underscores the importance of skill development and workforce readiness, offering detailed recommendations aligned with the National Skill Qualification Framework (NSQF), courses for Higher Education Institutions (HEIs) and National Credit Framework (NCrF). These frameworks aim to bridge the skill gaps by integrating vocational and technical education with industry requirements, ensuring a steady supply of talent for this rapidly evolving sector.

Drawing insights from successful models in countries like the United States, Taiwan, and South Korea, the report identifies strategies for India to enhance its competitiveness. These include fostering academia-industry collaborations, incentivizing startups and innovation, and building resilient supply chains through international partnerships. The report also emphasizes sustainability in semiconductor manufacturing, aligning with global efforts to minimize the environmental impact of this high-energy-intensive industry.

The preparation of this report has been an enriching experience, involving interactions with stakeholders from academia, industry, and government. Their inputs have been invaluable in shaping a holistic perspective on the opportunities and challenges facing India's semiconductor sector. As the former Chairperson of the National Council for Vocational Education and Training (NCVET), I strongly advocate for a collaborative approach that integrates policy, technology, and human capital to realize the vision of a self-reliant and globally competitive semiconductor ecosystem.

I extend my gratitude to all the esteemed members of the Committee namely Shri K.K. Dwivedi, Additional Secretary, MSDE, Ms Trishaljit Sethi, Director General, DGT, Dr. Abhay Jere, Vice Chairperson, AICTE, Shri Ved Mani Tiwari, CEO, NSDC, Col. Gunjan Chowdhary, Director, NCVET, Shri Mukul Kumar Yadav, Scientist D, MEITY and Dr. Abhilasha Gaur, CEO, NASSCOM SSC (Former CEO, ESSCI) for providing their valuable inputs, insights and support in bringing out this report. I acknowledge their invaluable contribution in formulation of this report in such a short timeframe.

I would also like to thank Dr. Neena Pahuja, Executive Member, NCVET, Mr. Abhinav Mishra and Mr. Subramanian Rajendran, consultants at NCVET for their persistent help and assistance in preparing this document. It is my earnest hope that this report serves as a catalyst for informed decision-making and actionable strategies to propel India towards a leadership position in the global semiconductor landscape.

(Dr. Nirmaljeet Singh Kalsi)
Former Chairperson,
National Council for Vocational
Education and Training (NCVET)

CONSTITUTION OF COMMITTEE

To address the requirements of a skilled workforce in the semiconductor industry, a committee has been constituted by Ministry of Skill Development and Entrepreneurship under the chairpersonship of Dr. Nirmaljeet Singh Kalsi, Former Chairperson, NCVET vide Order no. 32001/20/2023/NCVET to formulate strategies and action plan for skilling in the semiconductor industry. The composition of committee is as follows.

Sl. No	Name and Designation	Role
1.	Dr Nirmaljeet Singh Kalsi, Former Chairperson, NCVET	Chairperson
2.	Ms. Sonal Mishra, Joint Secretary, MSDE	Member
3.	Dr Abhay Jere, Vice Chairperson, AICTE	Member
4.	Shri Ved Mani Tiwari, CEO, NSDC	Member
5.	Col. Gunjan Chowdhary, Director, NCVET	Member
6.	Representative from MEITY	Member
7.	Representative from DGT	Member
8.	Dr. Abhilasha Gaur, CEO, SSC NASSCOM, Former CEO, ESSCI	Member Secretary

TERMS OF REFERENCE OF THE COMMITTEE

a. To formulate strategies for both short-term and long-term skilling initiatives in the field of semiconductor value chain, including skilling & upskilling programs catering to the needs of semiconductor industry.
b. Engagement with investing companies like Micron Technology to comprehensively assess the specific skilled workforce requirements, thereby developing a structured training plan.
c. Identification of optimal course combinations with an aim to integrate the semiconductor training in technical institutions (engineering and polytechnic Institutes) and leverage training infrastructure available at Semiconductor Ltd (SCL) and other such facilities in India.

The Final Report has agreement and signature of all the esteemed members of the Committee.

INDIA SEMICONDUCTOR WORKFORCE DEVELOPMENT STRATEGY REPORT

We, the undersigned members of the Committee constituted by Ministry of Skill Development and Entrepreneurship (MSDE) vide Order no. 32001/20/2023/NCVET dated 09th October 2023 for developing strategies addressing the urgent need for skilled workforce in the Semiconductor Industry, hereby submit the final Report of India Semiconductor Ecosystem workforce development Strategy report:

Sl. No	Name and Designation	Role	Signature with Date
1.	Dr Nirmaljeet Singh Kalsi, Former Chairperson, NCVET	Chairperson	
2.	Ms. Sonal Mishra, Joint Secretary, MSDE	Member	
3.	Ms Trishaljit Sethi, Director General, DGT	Member	
4.	Dr Abhay Jere, Vice Chairperson, AICTE	Member	
5.	Shri Ved Mani Tiwari, CEO, NSDC	Member	
6.	Col. Gunjan Chowdhary, Director, NCVET	Member	
7.	Shri Mukul Kumar Yadav, Scientist D, MEITY	Member	
8.	Dr. Abhilasha Gaur, CEO, SSC NASSCOM (Former CEO, ESSCI)	Member Secretary	

INDIA SEMICONDUCTOR WORKFORCE DEVELOPMENT STRATEGY REPORT

1 Introduction

According to G. Busch, a physicist and science historian, the term “semiconducting” was first used by Alessandro Volta in 1782. A key early observation came in 1833, when Michael Faraday discovered that silver sulphide's resistance decreased with temperature which was an unusual property at that time, as most conductors exhibited increased resistance with rising temperature. This behaviour hinted at the unique characteristics of semiconductors. Notably, in 1901, Indian scientist Jagadish Chandra Bose patented one of the earliest semiconductor devices, the “cat whisker,” used in radio wave detection. The modern semiconductor era began with the invention of the transistor in 1947, which replaced bulky vacuum tubes and transformed the landscape of electronic design. Since then, semiconductor technology has advanced rapidly, evolving from 17nm (nano meter) fabrication nodes in the 1990s to today’s cutting-edge 4nm processes, with consistent gains in performance, energy efficiency, and miniaturization.

These technological leaps are supported by a highly intricate and interdependent semiconductor value chain, encompassing design, fabrication, assembly, testing, and packaging. Each stage requires deep domain expertise, from electronic design automation (EDA) to cleanroom operations, materials engineering, and precision manufacturing. As the global semiconductor landscape grows increasingly complex and competitive, the demand for specialized talent across this value chain continues to rise. Despite growing industry demand, India faces a significant skills gap that could impede its ambitions. The scarcity of skilled professionals in fabrication, Assembly, Testing, Marking, Packaging (ATMP), and process engineering poses a challenge to scaling up domestic capabilities.

A comprehensive workforce development framework is therefore essential to bridge this gap and sustain India’s competitiveness. This includes identifying core and emerging skill sets, upgrading academic and vocational training programs, and fostering strong industry-academia linkages. By building a future-ready semiconductor workforce, India can not only meet domestic industry needs but also position itself as a talent hub in the global semiconductor ecosystem, contributing significantly to national technological and economic advancement.

1.1 Importance and significance of semiconductors in today’s world and future world of technological advancement

The semiconductor industry has been a driving force behind the digital revolution, enabling exponential growth in computing power, storage capacity, and connectivity. These advances have transformed key sectors such as information technology, telecommunications, and e-commerce, while also catalyzing innovation across cross-sectoral domains including healthcare, education, transportation, and manufacturing.

At the core of this transformation are semiconductors that form the basis of devices like transistors, diodes, integrated circuits (ICs), and sensors. These devices power the functionality of everyday technologies such as computers, smartphones, televisions, and industrial systems.

The emergence of the Internet of Everything (IoE) is ushering in a new wave of digital transformation. Technologies including smart home devices, wearables, industrial robotics, and autonomous farming systems increasingly rely on semiconductor technology. With continued technological progress, the significance of semiconductors is only set to increase. Cutting-edge domains like quantum computing, Artificial Intelligence (AI), 5G telecommunications, robotics, and Augmented/Virtual Reality (AR/VR) will continue to depend on rapid semiconductor innovation, shaping the future of technology, society, and the global economy.

Semiconductors are now not only technological enablers but also strategic assets, influencing national security, economic resilience, and global supply chain dynamics. As semiconductor applications expand across sectors, the availability of skilled professionals will be central to sustaining innovation and national self-reliance.

1.2 Global and Indian Prospects of the Semiconductor Industry:

The global semiconductor market stood at approximately USD 440 billion in 2020 and is projected to reach USD 1 trillion by 2030, according to McKinsey's report "The Semiconductor Decade: A Trillion-Dollar Industry." This surge is being driven by the widespread adoption of advanced technologies such as artificial intelligence (AI), the Internet of Things (IoT), robotics, and 5G, is coupled with demand for increased data processing, storage, and transmission capacity.

In line with global industry expansion, India's semiconductor market is poised for significant growth. The Indian semiconductor market was valued at USD 15 billion in 2020 and is expected to grow to USD 64 billion by 2025 and USD 110 billion by 2030, accounting for nearly 10% of global demand. Key growth sectors include smartphones and wearables, automotive electronics, data storage systems, and industrial automation.

A critical underlying factor behind this exponential industry growth has been Moore's Law, formulated by Gordon Moore in 1965. It observed that the number of transistors on an integrated circuit (IC) would double approximately every two years, resulting in a corresponding increase in computing power and energy efficiency at a lower cost. For decades, Moore's Law served as the engine of innovation, shaping the cadence of semiconductor development and setting expectations for continual performance enhancement.

However, as transistor sizes approach physical and atomic limitations, now at 04 nanometers and below, sustaining this pace of progress has become increasingly complex and costly. To extend the relevance of Moore's Law, researchers and manufacturers are investing in advanced semiconductor materials and new device architectures. These include:

a. Germanium, known for higher electron mobility than silicon
b. High-power Gallium Nitride (GaN) for power electronics
c. Antimonide and bismuthide-based materials, graphene, tin oxide, and pyrite, each offering unique performance or cost advantages

India's emergence as a global innovation and manufacturing hub will depend on its ability to align with this evolving landscape. Recognizing the scale of this opportunity, the Government of India has launched the India Semiconductor Mission (ISM) to strengthen domestic innovation, manufacturing, and talent development. A detailed overview of ISM is provided in Section 1.6.

1.3 Gaps and Challenges need to be addressed:

While India has made commendable progress in the semiconductor sector, several challenges continue to exist within the current ecosystem. The Government of India remains committed to its objective of catalysing the overall semiconductor ecosystem as a critical enabler for expanding the nation's rapidly growing electronics manufacturing and innovation landscape.

In this regard, focused and strategic interventions are being undertaken to address following key challenges:

a. High capital investment requirements, especially in establishing fabrication and packaging facilities
b. Limited R&D and innovation capacity, particularly in advanced materials and process technologies
c. Inadequate infrastructure, including cleanrooms, specialized tools etc.
d. Shortage of industry-ready skilled workforce across design, fabrication, and ATMP functions
e. Need for a resilient supply chain, covering materials, tools, and logistics

In response, proactive policy measures are being implemented to strengthen India's semiconductor manufacturing and design capabilities and to ensure greater self-reliance in this strategic domain.

The convergence of India's potential in semiconductor manufacturing, availability of a young and skilled workforce, enabling policy framework, strategic geographical advantage, technological advancements, investments by key industry stakeholders, and global collaborations for supply chain resilience is expected to position India as a preferred global destination for semiconductor manufacturing and innovation.

1.4 Key takeaways from different countries

As the global semiconductor industry evolves rapidly, countries have adopted diverse strategies to build resilient, innovation-driven ecosystem across the value chain.

Table 1 Takeaways from other nations

S.No.	Country	Takeaways
a.	**U.S.A** *World leader in semiconductor design, strong IP base*	The USA enacted the **CHIPS and Science Act (2022)** with USD 52 billion in funding for semiconductor R&D, domestic manufacturing, and STEM workforce development. It includes tax credits to incentivize investment in domestic fabrication facilities. The U.S. semiconductor industry benefits from a strong ecosystem of universities, research institutions, and a skilled workforce.
b.	**South Korea** *Strength in memory chips, fab operations*	Korea-Semiconductor Belt policy (K-Belt) provides for tax incentives, R&D subsidies, and infrastructure support to attract investment and build a national semiconductor cluster. The policy also emphasizes vocational training programs to develop a future-ready workforce aligned with industry needs.
c.	**Taiwan** *Global leader in advanced chip manufacturing (TSMC)*	Taiwan leads in deep integration of foundries, packaging, and testing. To support this, six university-based semiconductor research institutes are set up with industry governance. Early introduction of chip-related curriculum in vocational and high schools strengthens foundational skills. Corporate-led training programs like TSMC's onboarding centre accelerate hands-on workforce readiness.
d.	**Malaysia** *Global hub for ATMP operations*	Malaysia's National Semiconductor Strategy includes RM 25 billion in fiscal support to upskill 60,000 engineers by 2030 to meet growing industry demand. Initiatives like the Penang STEM Talent Blueprint focus on early talent development. German-style TVET programs with RM 1.2 billion funding strengthen vocational and STEM education.
e.	**Japan** *Global leader in semiconductor materials and equipment manufacturing*	The government subsidies and tax incentives to rebuild domestic chip production. It produces over 30% of the world's lithography and wafer tools. Public–private initiatives support next-gen technologies like 2 nm chips, backed by JPY 2 trillion in strategic R&D funding. Strong university–industry partnerships and reskilling programs aim to address workforce gaps and support fabs.
f.	**China** *Leads in Chip assembly*	Focuses on building its manufacturing capabilities and investing in R&D to develop homegrown technologies. China excels in Wafer fabrication, packaging, and foundry services. The country aims to reduce its dependency on foreign semiconductor technology through initiatives like the Made in China 2025 plan.

India's strategic roadmap for the semiconductor industry focuses on prioritizing R&D funding, fostering collaboration between government, academia, and industry, and providing financial incentives, tax breaks, and infrastructure support. The plan includes investing in advanced manufacturing infrastructure, emphasizing education and workforce development, and engaging in long-term strategic planning with government support. It also highlights the importance of quality control, testing standards, and reliability assurance, along with promoting technology transfer and international collaboration. India brings to this effort a strong engineering talent pool, well-established chip design capabilities, and a proactive policy environment. Collectively, these initiatives aim to accelerate growth, enhance innovation, and establish India as a competitive player in the global semiconductor ecosystem.

Across all global semiconductor leaders, three common pillars emerge namely, sustained investment in R&D, strong industry-academia linkages for workforce readiness, and targeted public support through fiscal or infrastructural incentives. India’s roadmap appropriately reflects these elements, but will need sharper focus on advanced manufacturing skilling, Intellectual Property(IP) creation, and tighter integration of academic programs with fab and ATMP job roles to match global benchmarks.

1.5 India’s Plan to deepen its Presence in Global Semiconductor Value Chain

The Union Cabinet had approved the comprehensive Semicon India program with a financial outlay of ₹76000 crores for the development of a sustainable semiconductor and display ecosystem in 2021. Semicon India Program aims to provide attractive incentive support to companies/consortia that are engaged in Silicon Semiconductor Fabs, Display Fabs, Compound Semiconductors/Silicon Photonics /Sensors (including MEMS (Micro-Electro-Mechanical Systems) Fabs, Semiconductor Packaging (ATMP / OSAT (Outsourced Semiconductor Assembly and Test)) and Semiconductor Design. The following schemes have been notified:

a. Modified Scheme for setting up of Semiconductor Fabs in India
b. Modified Scheme for setting up of Display Fabs in India
c. Modified Scheme for setting up of Compound Semiconductors/Silicon Photonics/ Sensors Fab / Discrete Semiconductors Fab and Semiconductor Assembly, Testing, Marking and Packaging (ATMP) / OSAT facilities in India
d. Designed linked incentive (DLI) scheme

Up to 2.5% of the outlay of the first three schemes is allocated to the R&D, Skill Development and Training requirements. The Union Budget 2024 has allocated ₹6,903 crore to the Ministry of Electronics and Information Technology (MeitY) for the “Modified Programme for Development of Semiconductors and Display Manufacturing Ecosystem in India.”

A considerable portion of this funding, amounting to ₹ 4,203 crore, is earmarked for the “Modified Scheme for setting up of Compound Semiconductors/Silicon Photonics/Sensors Fab/Discrete Semiconductors Fab and Semiconductor Assembly, Testing, Marking and Packaging (ATMP)/ Outsourced Semiconductor Assembly and Test (OSAT) facilities in India.” This investment comes at a critical time, as the global semiconductor industry is projected to require nearly 1 million additional skilled professionals by 2030, particularly in areas such as fabrication, packaging, and design verification (*Deloitte Global Semiconductor Talent Shortage report, 2022*). India produces over 1.5 million engineers annually, yet less than 3% are considered semiconductor-ready. While India has made significant strides in chip design, with over 125,000 engineers engaged in design services, there is a marked shortage of fab operators, process technicians, and ATMP engineers—skills essential for the complete semiconductor value chain.

With targeted investment in skilling programs, vocational education, and curriculum alignment, India has the potential to bridge this talent gap. By doing so, it can position itself not only to meet domestic industry demands but also to become a global semiconductor talent hub.

1.6 India Semiconductor Mission (ISM)

India Semiconductor Mission (ISM) is a specialized and independent Business Division within the Digital India Corporation that aims to build a vibrant semiconductor and display ecosystem to enable India’s emergence as a global hub for electronics manufacturing and design. Envisioned to be led by global experts in the Semiconductor and Display industry, ISM serves as the nodal agency for efficient, coherent and smooth implementation of the schemes. ISM has been launched as a key strategic response to unlock India’s potential in high-tech electronics and chip manufacturing. It is expected to generate ₹6.5 lakh crore in incremental GDP, attract over ₹1 lakh crore in investment, enable ₹1.6 lakh crore worth of exports, and create over 32,500 high-skilled direct jobs and 1 lakh indirect jobs over the next 20 years.

To achieve these outcomes, ISM envisions building a vibrant semiconductor and display design and innovation ecosystem to enable India’s emergence as a global hub for electronics manufacturing and design. Below are some objectives of the ISM:

a. Formulation of a comprehensive long-term strategy for developing semiconductors & display manufacturing facilities and semiconductor design ecosystem in the country in consultation with Government ministries / departments / agencies, industry, and academia.
b. Facilitation in the adoption of trusted electronics through secure semiconductors and display supply chain, including raw materials, specialty chemicals, gases, and manufacturing equipment.
c. Enabling a multi-fold growth of Indian semiconductor design industry by providing requisite support in the form of Electronic Design Automation (EDA) tools, foundry services and other suitable mechanisms for early-stage start-ups.

d. Promoting indigenous Intellectual Property (IP) generation and encourage, enable and incentivize Transfer of Technologies (ToT).
e. Enabling collaborations and partnership programs with national and international agencies, industries and institutions for catalysing collaborative research, commercialization and skill development.

1.7 Government Initiatives

a. **Enabling Growth of Semiconductors in the Country**

The Government of India has granted approval to Tata Electronics Pvt. Ltd (TEPL) for setting up a Semiconductor Fab facility in Dholera, Gujarat with a total investment of approximately ₹91,300 crores (USD 11 billion). Tata Electronics in association with Taiwan’s Powerchip Semiconductor Manufacturing corp.(PSMC) is set to establish semiconductor fab unit with a production capacity of 50000 wafers per month. The Union Cabinet approved a new semiconductor plant in Uttar Pradesh's Jewar to be jointly set up by HCL Group and Foxconn. The newly approved facility will come up at an investment of Rs 3,700 crores.

The Government has also approved three ATMP/OSAT facilities:

i. Micron Technology Inc. in Sanand, Gujarat
ii. Tata Electronics Pvt. Ltd (TEPL) in Morigaon, Assam
iii. CG Power and Industrial Solutions in Sanand, Gujarat

These approvals come with a total investment of approximately ₹61,005 crores (USD 7.35 billion). Approval has been granted to Eleven (11) domestic start-ups for support under the Design Linked Incentive (DLI) Scheme. The list is as follows:

i. Tessolve Semiconductor
ii. AB Circuits and Research Labs
iii. Photom Technologies
iv. SemiCon Laboratories
v. Vedanta
vi. Intel
vii. Jabil Circuit
viii. Flextronics
ix. Tejas Networks
x. VVDN Technologies
xi. HFCL

India also aims to reduce reliance on imports and boost self-dependence in the semiconductor industry. The Israel-based International Semiconductor Consortium has announced plans for the construction of India’s first semiconductor fabrication plant.

b. Development of Skilled and Talented Workforce

Capacity building and skill development is foundation of the Semicon India program and require dedicated programs in semiconductor domain. Up to 2.5 % of the outlay of the following three schemes is allocated to the R&D, Skill Development and Training requirements. To develop a roadmap for "India as a Semiconductor Talent Nation", a committee was constituted in August 2022 with the representatives from Semiconductor Industry, Academia and Government. The committee has submitted its Report “Semicon India Future Skills Talent Committee Report”. The report can be accessed at SemiconIndia Future Skills Talent Committee Report (d2p5j06zete1i7.cloudfront.net) As per the report, an estimated additional 2,75,000 manpower will be required by 2032 in VLSI (Very Large Scale Integration) chip design sector and an estimated 25,000 and 29,000 manpower will also be required for fab and ATMP facilities respectively in the country in next 10 years.

The committee also proposed for revisiting curriculums to develop a Semiconductor Industry ready workforce to meet the increasing requirement of semiconductor design engineers, MeitY has started Chips to Start-up (C2S) Programme to train 85,000 students in the next 4/5 years. Altogether, 103 academic institutions/organisations across the country are participating in the Scheme. New curriculums in VLSI Design and Semiconductor Technology have been launched by AICTE at UG & Diploma level as a step towards creation of Talent pool in Semiconductor domain. ISM has signed a MoU with Purdue University, USA, to enable collaboration for development of skilled workforce and specialized R&D programs. Lam Research, USA, Semiconductor Equipment Manufacturer has announced in 2023 Semicon India Conference, to train 60,000 workforce in the next 10 years through its Semiverse Solution virtual platform in collaboration with Indian academic institutions.

c. Enabling R&D Ecosystem in the country

MeitY has consulted with representatives from Industry, Academia and Government to create a roadmap for Semiconductor Research & Development in the country and to establish a world-class research facility to drive an innovation roadmap for R&D in advanced and next generation of semiconductors, packaging, systems technologies, processes and materials.

d. Promoting Start Ups and Entrepreneurship

The Design Linked Incentive (DLI) Scheme has been specifically initiated to promote entrepreneurship and support start-ups in the semiconductor chip design sector. By offering financial incentives and access to advanced design infrastructure, the scheme aims to empower domestic start-ups and MSMEs at critical stages of design, development, and deployment of semiconductor IPs, chips, and products. This initiative is geared toward fostering innovation, encouraging new business ventures, and building a self-reliant semiconductor ecosystem that drives import substitution and value addition in strategic, social, and financial sectors over the next five years.

e. Semiconductor Supply Chain resilience through International Collaborations

Recognizing the internationally integrated nature of Semiconductor Industry, Government of India started engaging with other countries to establish a resilient Semiconductor Supply Chain and Innovation Partnership. Government of India had signed MoU with USA, Japan and European Union towards enhancement of semiconductor supply chains and leverage complementary strengths.

2 Semiconductor value chain

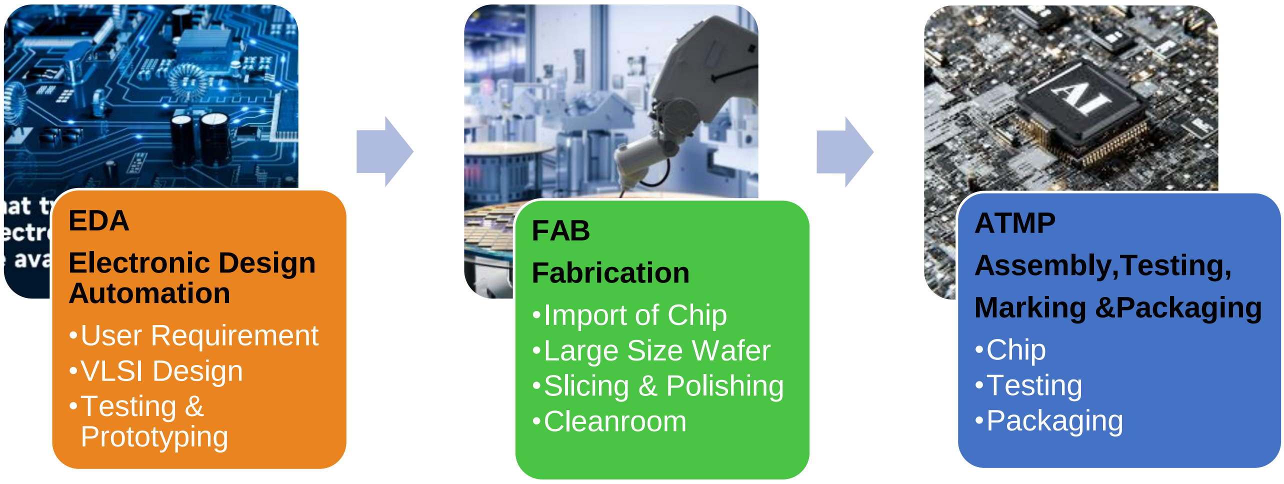


Figure 1 Semiconductor value chain

2.1 R&D and Design

Research and Development (R&D) forms the foundation of the semiconductor value chain. It is the critical first stage where innovation, design, and technical feasibility are explored to develop next-generation semiconductor devices. R&D efforts focus on studying material properties, developing new fabrication techniques, and designing complex integrated circuits that meet industry and application-specific requirements.

This stage involves multidisciplinary teams comprising engineers and scientists with expertise in materials science, electronics, physics, and computer engineering. The chip design process is a highly structured and iterative workflow that includes the following stages:

a. **System Specification and Architectural Design**
This initial step defines the chip's intended functionality, performance metrics, and design constraints. Architects determine whether to use Reduced Instruction Set Computer (RISC) or Complex Instruction Set Computer (CISC) architectures, select pipeline structures, decide on cache sizes, and balance trade-offs in cost, performance, and power consumption. This culminates in the development of a Micro-Architectural Specification (MAS), which outlines the functional blueprint of the chip.

b. **Functional Design**
At this stage, designers create high-level functional specifications that describe the logic, algorithms, and data flows necessary to meet system-level requirements. This specification acts as a roadmap for downstream design tasks.

c. Logic Design

The logical behavior of the chip is implemented using Hardware Description Languages (HDLs) such as Verilog or VHDL. Logic simulation and verification are conducted to ensure that the circuit performs as intended under different scenarios.

d. Circuit Design

Here, engineers select the actual electronic components like transistors, capacitors, resistors and define how they are connected to implement the logical circuits. Power management and clock distribution networks are also designed in this phase.

e. Physical Design and Verification

This stage involves translating the circuit schematic into a physical layout that adheres to design rules for manufacturability. Techniques such as Design Rule Check (DRC), Layout Versus Schematic (LVS), and timing and power analysis are used to ensure the layout meets performance and reliability standards.

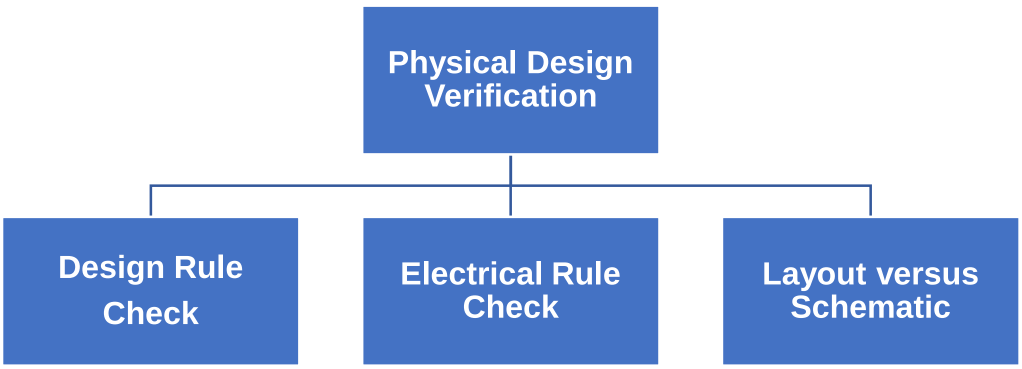


Figure 2 Physical Design Verification

f. Electronic Design Automation (EDA) Tools

EDA tools support each phase of the design process and are essential for handling the complexity of modern semiconductor design. These tools facilitate schematic capture, circuit simulation, layout, verification, and emulation. Some of the key functions include:

i. Schematic Capture: Creating circuit diagrams with component libraries
ii. PCB Layout and Design: Placing and routing components under performance constraints
iii. Simulation: Analyzing signal integrity, power consumption, and thermal behavior
iv. Verification: Validating that the design meets all specified requirements

In some cases, dedicated hardware like emulators and prototyping boards complement EDA software to manage large-scale data processing during design validation. Upon successful verification, the design is sent to fabrication units (fabs) for production. This seamless transition from R&D and design to fabrication underscores the strategic importance of this phase in the semiconductor value chain. To support this phase, a range of skilled professionals is required, including EDA Tool Assistants, Schematic Entry Operators, Design Verification Assistants, DFT (Design for Testability) Technicians, Functional Verification Engineers, and SoC Verification Architects etc. These roles demand a combination of domain knowledge in circuit theory, logic design, and tool-based simulation, along with practical exposure to industry-grade EDA platforms as detailed in Section 2.7.

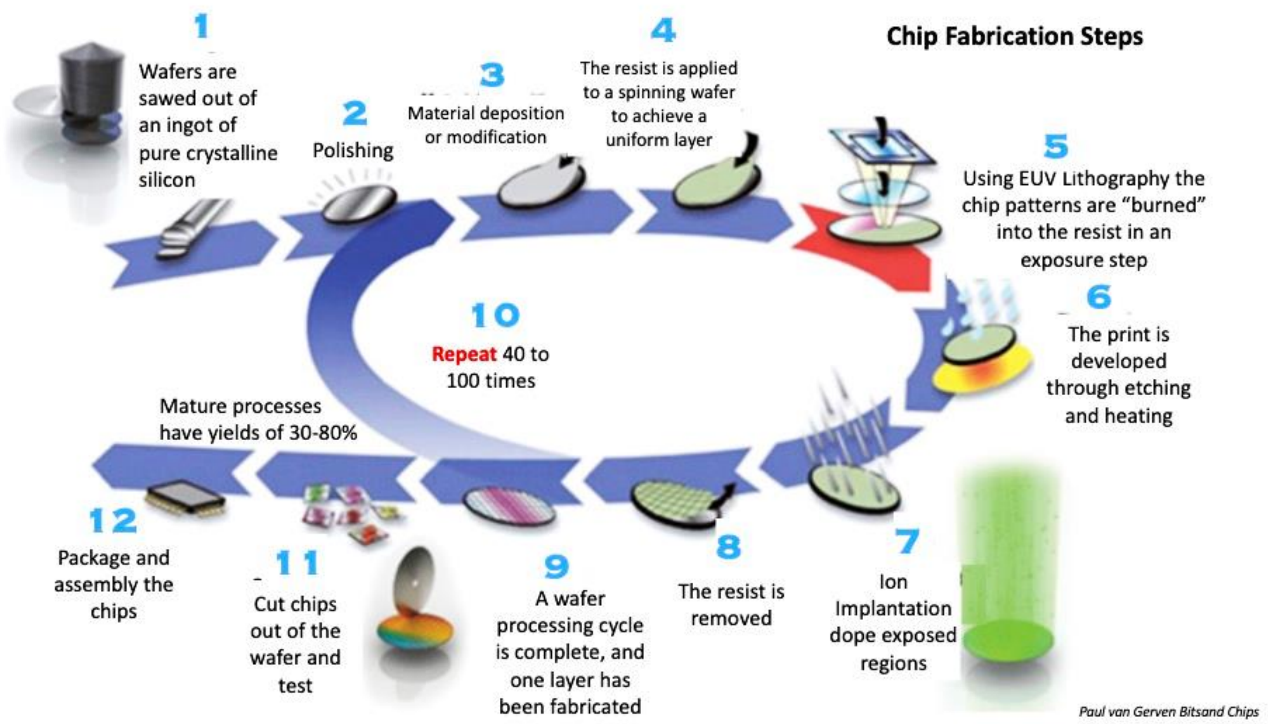


Figure 3 Semiconductor Manufacturing Flow

2.2 Fabrication

Semiconductor chips are manufactured through a highly complex process in specialized facilities known as fabs or foundries. This stage which is referred to as front-end fabrication, involves building semiconductor devices on thin, circular silicon wafers, typically 200 mm (8 inches) or 300 mm (12 inches) in diameter. Each wafer contains hundreds of individual microchips (dies), smaller than a postage stamp.

The fabrication process begins with surface preparation. Sliced silicon wafers have rough surfaces and microscopic defects that must be removed. Precision Chemical-Mechanical Planarisation (CMP) is used to create an ultra-smooth and defect-free surface essential for accurate circuit patterning.

Since raw silicon is not conductive, wafers are then subjected to oxidation, where a thin layer of silicon dioxide is grown on the surface. This oxide film plays a dual role; it protects the wafer during processing and acts as an insulator to prevent current leakage between integrated circuits.

While silicon is the most common substrate, other materials are increasingly used to meet advanced performance needs; Sapphire, Silicon Carbide (SiC), and Gallium Arsenide (GaAs) are preferred in high-frequency, high-power, and optoelectronic applications. Advanced materials like BT (Bismaleimide Triazine), ABF (Ajinomoto Build-up Film), and MIS (Molded Interconnect Substrate) are used in complex package substrates and interconnect solutions.

These substrates may undergo doping, surface treatment, or polishing to enhance electrical properties, thermal performance, and process compatibility. Importantly, larger wafer diameters allow more chips to be manufactured per wafer, improving production efficiency and reducing cost per chip.

2.2.1 Photolithography

To fabricate billions of microscopic features such as transistors on each semiconductor chip, the wafer is first coated with a light-sensitive material known as a photoresist. A photomask which contains the circuit pattern blueprints, is then aligned over the wafer, and specific wavelengths of light are projected through it. This process, known as photolithography, enables the transfer of intricate patterns onto the wafer surface, similar to using a stencil in traditional printing.

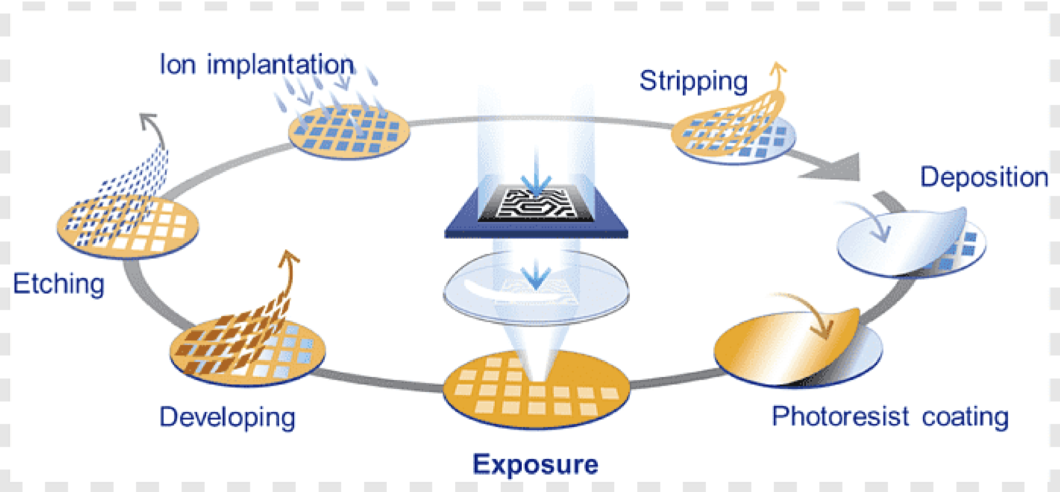


Figure 4 Semiconductor fabrication

Photolithography defines the critical features of semiconductor devices with nanometer precision. The equipment used in this process typically includes a light source, optical lenses, mask aligners, and modules for photoresist coating and development. Once exposed, the wafer undergoes chemical development, during which the unexposed (or exposed, depending on resist type) photoresist is removed ultimately revealing the desired pattern. This step is analogous to developing a photograph. After development, wafer inspection ensures that the pattern is correctly formed and aligned.

The wafer then proceeds to the etching stage, where the unprotected material and parts of the underlying silicon are selectively removed to create the desired circuit architecture. This step prepares the wafer for further layering and process stages in the fabrication flow.

2.2.2 Etching

Following photolithography, etching is a critical process used to selectively remove exposed layers from the wafer surface to form intricate circuit patterns. This step is essential for transferring the desired features onto the wafer without compromising the stability or integrity of the underlying structures.

During etching, the wafer undergoes additional baking and development steps, during which parts of the photoresist are washed away to reveal a three-dimensional pattern of open channels on the wafer. The exposed areas are then etched to form the required features.

There are two primary types of etching techniques:

a. **Dry Etching:** Uses reactive gases or plasma to etch the exposed pattern with high precision. It is preferred for its directional (anisotropic) capabilities.
b. **Wet Etching:** Involves immersing the wafer in chemical baths to dissolve specific materials. Though less precise, it is simpler and suitable for some bulk etching steps.

The choice of etchants and process type depends on factors such as material compatibility, etch rate, selectivity, and the desired resolution. Common chemicals used in wet etching include hydrochloric acid, sulfuric acid, and ammonium hydroxide. In dry etching, specialized gases like silane, phosphine, and tungsten hexafluoride are used to achieve fine feature definition.

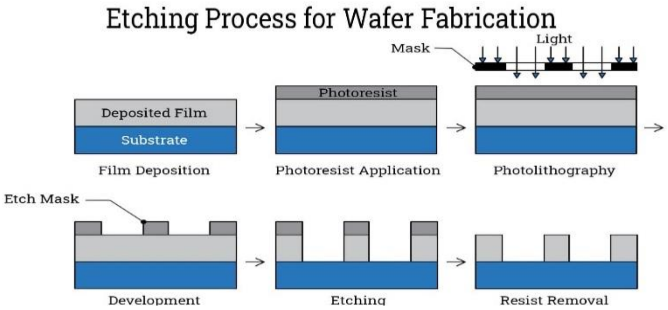


Figure 5 Etching process

The photolithography process and the etching process are repeated several times on the Wafer layer by layer.

2.2.3 Ion Implantation

Once the patterns are etched onto the Wafer, the Wafer undergoes a process wherein it is bombarded with positive or negative ions to modify the electrical conducting properties of specific areas of the pattern. The raw silicon, which forms the base material of the Wafer, exhibits electrical properties that are neither fully insulating nor fully conducting. By directing electrically charged ions into the silicon crystal structure, the flow of electricity can be precisely controlled, enabling the formation of transistors which are fundamental components that act as electronic switches in microchips. This critical process is referred to as ion implantation.

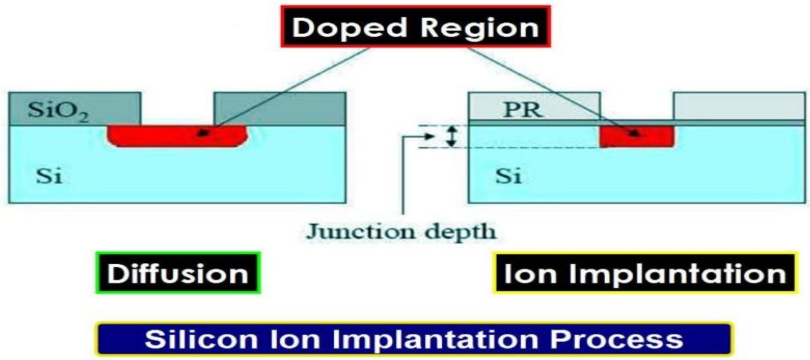


Figure 6 Ion Implantation

After Ion implantation, the remaining resist material is removed. Additional manufacturing processes include material deposition, Wafer cleaning and smoothing (wet cleaning and planarization), and thermal treatments such as diffusion and annealing.

2.2.4 Deposition

Deposition process in semiconductor fabrication is used to apply extremely thin layers of material onto the wafer surface. These thin films serve various functions such as conductors, insulators, or semiconductors. They are essential for creating the multi-layered structures found in integrated circuits.

The process involves coating the wafer at a molecular or atomic level, which requires highly precise and sophisticated equipment to ensure uniformity and adherence. The quality and characteristics of these thin films directly impact the electrical performance and reliability of the final chip.

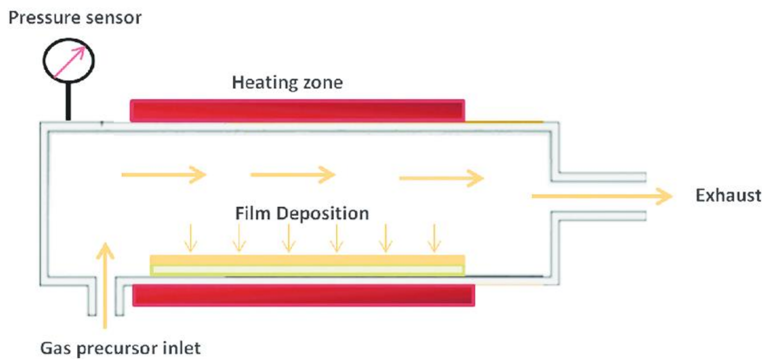


Figure 7 Chemical Vapor Deposition

Deposition techniques are broadly categorized into:

a. **Physical Vapour Deposition (PVD):** Involves vaporizing a material and condensing it onto the wafer.
b. **Chemical Vapour Deposition (CVD):** Uses chemical reactions of gaseous precursors to form solid films on the wafer surface.

Both techniques are used depending on the material type and application. Deposition forms the foundation for subsequent steps like doping, etching, and patterning, making it a critical part of the front-end fabrication process. These techniques allow for the precise control of film thickness, composition, and properties. Deposition equipment includes tools such as CVD reactors and sputtering systems.

2.2.5 Chemical Mechanical Planarization (CMP)

CMP is a polishing technique used to achieve a flat and smooth surface on the Wafer after various deposition and etching steps ensuring planarity and uniformity.

It involves the mechanical abrasion of the Wafer surface using a slurry containing abrasive particles, combined with chemical etching to remove material. CMP is critical for subsequent lithography and etching processes. It ensures uniformity across the Wafer surface, critical for the precision required in semiconductor manufacturing.

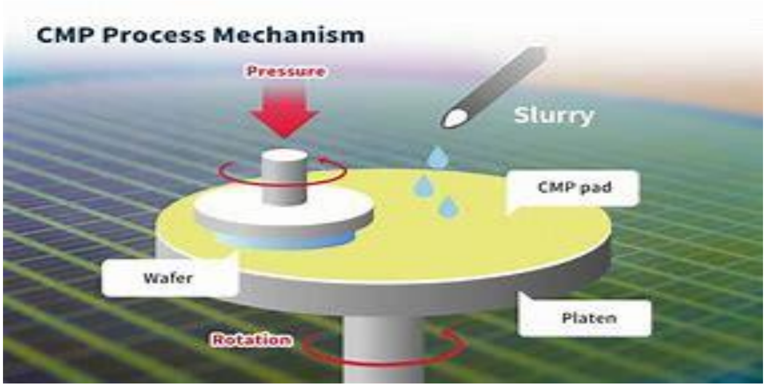


Figure 8 Chemical Mechanical Planarisation

2.2.6 Metrology

Metrology ensures accuracy, uniformity, and reliability at every stage of wafer processing. Metrology tools are used throughout the manufacturing cycle to measure physical and electrical parameters of wafer features, enabling process control and defect prevention. Key applications of metrology in the fabrication process include:

a. **After Photolithography:** Measuring Critical Dimensions (CD) to confirm that the circuit patterns have been accurately transferred from the photomask to the wafer surface.
b. **Post-Etching:** Verifying the depth and profile of etched features to ensure conformance to design specifications.
c. **After Deposition:** Measuring thin film thickness and uniformity to ensure each layer falls within acceptable tolerances.

d. **During Chemical Mechanical Planarization (CMP):** Monitoring wafer planarity and thickness after polishing to maintain surface flatness and uniformity.
e. **After Ion Implantation:** Measuring ion dose and energy to confirm proper doping levels without damaging the wafer.
f. **Final Inspection:** Conducting a comprehensive assessment of critical dimensions, film thicknesses, and wafer quality before moving on to dicing and packaging stages.

Metrology ensures that each fabrication step meets design and performance requirements, thereby improving process yields and supporting the production of reliable, high-performance semiconductor devices.

Job roles like Equipment Handling Operator, Materials Handling Technician, Wafer Cleaning Technician, Photolithography Technician, CMP Technician and Metrology Operator etc support these fabrication phases.

2.3 Assembly

After front-end fabrication of the chips, Wafers are typically sent to other specialised units for back-end manufacturing activities such as Assembly, Test and Packaging (collectively known as ATP). In these steps, chips are cut from the silicon Wafer, tested for performance, and packaged to protect the chip and to allow for its integration into finished electronic devices by attaching electrical interconnections.

During assembly, individual components, such as chips, are combined onto a single substrate, which is then encapsulated in a protective package. The assembly process typically involves wire bonding or flip-chip bonding techniques, which are used to connect the individual components together. Assembly equipment plays a crucial role in the manufacturing process of electronic devices by automating the placement, soldering, and packaging of electronic components onto printed circuit boards (PCBs). Key components of assembly equipment include:

a. **Pick and Place Machines**: Robotic arms with vacuum nozzles accurately place components on PCBs, offering high-speed and precision for densely populated boards.
b. **Reflow Soldering Ovens**: These ovens melt solder paste to attach surface-mount components to PCBs. Controlled heating ensures strong solder joints without damaging components.
c. **Wave Soldering Machines**: Used for through-hole components, these machines create reliable solder joints by passing PCBs over a wave of molten solder, ensuring precise temperature and wave height control.
d. **Automated Optical Inspection (AOI) Systems**: AOI systems use cameras to inspect PCBs for defects like missing or misaligned components and solder issues, ensuring early detection and quality control.
e. **Surface Mount Technology (SMT) Stencil Printers**: These printers apply solder paste to PCBs using stencils, ensuring precise deposition for high-quality solder joints during reflow soldering.

2.3.1 Solder Bumping

Solder bumping and flip chip technology are two sequential and interrelated processes used in the back-end packaging stage to connect a semiconductor die to a substrate or printed circuit board (PCB).

Solder bumping is a preparatory process where tiny spheres of solder (called bumps) are deposited onto the bond pads of a semiconductor die. These bumps act as electrical interconnects and mechanical anchors that will later be used to attach the die to a package substrate or PCB. Solder bumping is a prerequisite for flip chip assembly. Once the bumps are formed on the die, the die is flipped over so the bumps align with the matching pads on the substrate. The assembly is heated to reflow the solder, forming strong electrical and mechanical joints. A protective underfill (an insulating epoxy) is applied between the die and substrate to absorb mechanical stress and improve reliability. Before proceeding further, the wafer undergoes electrical testing to identify functional and non-functional dies. Probes contact the die pads to measure performance.

2.3.2 Flip Chip attachment

After wafer level (probe) testing, the wafer is singulated into individual dies using precision cutting tools. These discrete dies are now ready for mounting onto substrates or PCBs.

Flip chip is a die attachment technique in which the die is mounted face-down (with the solder bumps facing the substrate), as opposed to traditional methods like wire bonding. This approach enables direct electrical contact through the solder bumps, resulting in better electrical performance, higher I/O density, and improved thermal handling. The die is carefully aligned and placed. The assembly is passed through a reflow oven, melting the solder bumps to create strong electrical and mechanical bonds. Once the flip chip is attached, a protective underfill epoxy (electrically insulating) is dispensed between the die and the substrate.

2.4 Testing and Inspection

After wafer level packaging, chips undergo post-assembly testing to ensure performance and reliability. Testing and inspection are critical components of the semiconductor manufacturing process, ensuring that devices meet strict electrical, mechanical, and functional requirements at every stage from wafer fabrication to final product assembly.

Testing is conducted at multiple stages of the manufacturing process:

a. **Wafer-level testing:** Electrical tests are performed on the Wafer before it's diced into individual chips.
b. **Die-level testing:** Individual chips are tested after being separated from the Wafer.
c. **Package-level testing:** The final packaged device is tested to ensure it meets all electrical and functional specifications.

2.4.1 Types of Equipment Used for testing

a. **Component-Level Instruments**

i. **Oscilloscopes**, **multimeters**, and **spectrum analyzers** are used to measure electrical signals, voltages, currents, and frequency responses.
ii. These tools identify deviations from expected values and help pinpoint flaws such as leakage currents, signal noise, or timing issues.

b. **Advanced Inspection Tools**

i. Automated Optical Inspection (AOI) systems visually scan chips for defects such as misaligned components, open connections, or short circuits.
ii. Boundary Scan Testers evaluate interconnects in complex integrated circuits and PCBs, particularly where traditional test probes cannot access internal nodes.

c. **Automated Test Equipment (ATE)**

i. These high-speed systems perform comprehensive **functional testing** on packaged ICs and PCBs.
ii. They evaluate parameters like signal integrity, power distribution, timing accuracy, and protocol compliance.
iii. ATEs are often configured for parallel testing to maximize throughput in high-volume manufacturing environments.

2.4.2 Final Testing and Quality Assurance

In the final stages of assembly and integration, testing becomes increasingly rigorous.

a. **Functional Testers** simulate real-world operating environments to validate that devices perform as intended under various load conditions, voltages, and frequencies.
b. **Inspection Systems** (e.g., X-ray imaging, 3D AOI) examine solder joints, component placement, underfill, and encapsulation quality. These systems ensure that packaging processes have not introduced latent defects that could lead to early failure.

2.5 Packaging

In semiconductor manufacturing, packaging is the final stage of the back-end process, where the die is mechanically enclosed and electrically connected for protection, integration, and deployment. Once components are placed and soldered onto a substrate or PCB, packaging processes ensure the reliability, durability, and performance of the integrated circuit.

Packaging serves both functional and protective roles—safeguarding delicate silicon dies from environmental stress while enabling electrical connections to external systems. This may include processes such as conformal coating application, encapsulation with epoxy or silicone, or placement of protective covers and casings. Key steps in the packaging process include:

a. **Die attach:** The chip is attached to a substrate (leadframe or package body) using a bonding material like epoxy or solder.
b. **Encapsulation:** The chip and its connections are sealed within a protective material, often a plastic or ceramic compound.
c. **Molding:** The encapsulated chip is molded into its final package shape.
d. **Lead Framing (for certain packages):** Metal leads are attached to the package for electrical connections.

2.5.1 Encapsulation

Semiconductor Encapsulation, also known as chip packaging, is a process in semiconductor manufacturing that involves enclosing a semiconductor die, wire bonds, and interconnects in a protective material to form a complete integrated circuit package. The choice of material depends on factors such as the operating environment, the performance requirements of the device, and the manufacturing process used. Materials such as Epoxy resins, silicones, or other polymers are commonly used.

Methods for Encapsulation:

a. **Transfer molding:** Injecting molten encapsulant into a mold containing the bonded die.
b. **Underfill:** Dispensing encapsulant between the die and the package substrate to improve mechanical and thermal properties.
c. **Conformal coating:** Applying a thin layer of encapsulant to protect the device surface.

2.5.2 Advanced Packaging Technologies

Advanced packaging technologies play a crucial role in meeting the demands of miniaturization, integration, and performance in the semiconductor industry. Advanced-packaging techniques supplement traditional wire-bonding and flip-chip technologies. Types of advanced packaging technologies are as follows.

Table 2 Advanced Packaging Techniques

Technology	Description	Benefits
2.5-D and 3-D Integrated Circuits (ICs)	2.5-D ICs use interposers to connect chips, while 3-D ICs stack layers of chips vertically.	Increased functionality and connectivity, improved performance, reduced power consumption, enhanced miniaturization.
Fan-Out Packaging	Redistributes interconnects to support more I/Os and better thermal management, with smaller pitch sizes.	Supports heterogeneous integration, enhances performance, and allows for more I/Os.

System in Package (SiP)	Integrates multiple ICs, resistors, capacitors, and other components into a single package.	Enables significant miniaturization, reduced power consumption, and improved performance.
Through-Silicon Vias (TSVs)	Creates vertical connections between layers of a chip to enhance performance.	Reduces signal propagation delays, improves power distribution, and is crucial for 3-D ICs and advanced packaging solutions.

2.6 Cleanroom Systems

Cleanroom Systems provide sterile and controlled environments essential for semiconductor manufacturing. These regulated spaces ensure optimal air quality, temperature, humidity, and other environmental factors, which are crucial for maintaining the high standards required in this industry. Contamination of airborne particles can distort the patterns and cause defects. The various processes involved in semiconductor manufacturing industry need cleanrooms for the following:

a. Photolithography involves transferring patterns onto a semiconductor Wafer using light.
b. Etching process involves chemical procedures to clean Wafers and create precise circuit patterns. Cleanrooms prevent airborne particles from interfering with this process.
c. Deposition processes, such as Chemical Vapor Deposition (CVD) and Physical Vapor Deposition (PVD), involve placing material layers on Wafers. Cleanrooms ensure uniform and consistent, defect-free material layering by preventing airborne particles.
d. Testing semiconductor devices for functionality and reliability requires a contamination-free environment.

2.7 Skills required in Semiconductor Value Chain

Table 3 Skills required in Value chain

S.No	Areas of Expertise	Occupation	Skills Required
a.	**Design**	i. Integrated Circuit (IC) Design Engineer ii. Verification Engineer iii. Physical Design Engineer iv. Embedded Software Engineer v. IoT Hardware Analyst vi. Embedded Full Stack IoT Analyst	i. Knowledge about VLSI, Embedded systems, ii. IoT, EDA tools iii. logic gates CMOS, NMOS, System integration, Basics of Python, Real Time Logic RTL
b.	**Fabrication**	i. Wafer Dicing Engineer ii. Wafer Back Grinding Engineer iii. Wafer Test and Sort Engineer	i. Basics of Electrical and Electronics, ii. Semiconductor devices, iii. Wafer Dicing

			iv. Material expertise, knowledge of chemicals, quality assurance, Clean room operations for semiconductors, Industrial Safety for Semiconductor Manufacturing
c.	**Assembly, Testing Marking Packaging (ATMP)**	i. Saw Singulation – Process Engineer ii. Solder Ball Attach - Process Engineer iii. Welding Operator iv. Winding Operator v. Die Attach and Wire Bonding Engineer vi. Failure Analysis & Reliability Engineer	i. Industrial Safety for Semiconductor Manufacturing, ii. Essentials Fundamentals of IoT, iii. Clean room operations for semiconductors

2.7.1 Skills required in Cleanroom

Table 4 Skills required in Cleanroom

S. No.	Specific Areas	Description	Knowledge of/Focused Skills
a.	Cleanroom Protocol Adherence	Cleanroom environments are critical in industries such as semiconductor manufacturing, pharmaceuticals, biotechnology, and aerospace, where even the smallest contaminants can lead to product defects, compromised research outcomes, or safety hazards. Adhering to cleanroom protocols is essential to maintain the integrity of these controlled environments and prevent contamination.	i. Different classes of cleanrooms, their specific cleanliness requirements ii. Gowning and De-gowning Procedures iii. Various Contamination sources, iv. Appropriate cleaning agents v. Sterilization techniques such as autoclaving and chemical disinfection. vi. Proficiency in using specialized cleanroom equipment, including laminar flow hoods, High Efficiency Particulate Air (HEPA) filters, and other ventilation systems.
b.	Contamination Control	Contamination control is a critical aspect of semiconductor manufacturing, where even minute particles can jeopardize the integrity and	i. Control methods ii. Process Optimisation iii. Monitoring and Detection of Contamination iv. Quality Assurance

		functionality of electronic devices. It involves understanding the sources of contamination and implementing effective methods to prevent, detect, and mitigate its impact on the manufacturing process.	
c.	Chemical Handling and Safety	Skills in safely handling and storing hazardous chemicals and gases used in semiconductor manufacturing, including knowledge of Material Safety Data Sheets (MSDS) and proper use of personal protective equipment (PPE). Semiconductor manufacturing involves working with a variety of hazardous chemicals and gases, making it imperative for personnel to possess specific skills to ensure safety in handling and storage practices.	i. Chemical Knowledge ii. Material Safety iii. Data sheet interpretations iv. Proper Handling techniques v. Storage practices of Chemical gases vi. Emergency response preparedness
d.	Precision and Manual Dexterity and Environmental Monitoring	Ability to perform precise manual tasks required in a cleanroom environment, such as aligning and installing delicate components or manipulating tools and small parts. Performing precise manual tasks in a cleanroom environment demands a unique set of abilities characterized by dexterity, attention to detail, and focus	i. Fine motor skills ii. Hand eye coordination iii. Spatial Awareness iv. Patience and Perseverance v. Adaptability and Problem Solving skills
e.	Gas Flow	Understanding of the systems used to deliver specialty gases to the production equipment, including knowledge of pressure systems, flow rates, and safe change-out procedures.	i. Specialised Gases ii. System operation of gases iii. Safety protocols

		Effective management of gas flow and delivery systems is crucial in semiconductor manufacturing to ensure the reliability and efficiency of production processes. Individuals responsible for operating and maintaining these systems require a specific set of skills to handle specialty gases safely and efficiently	
f.	Equipment Operation	Proficiency in operating complex machinery and equipment used in cleanrooms, including lithography, etching, and deposition machines. Operating complex machinery and equipment in cleanroom environments is essential for semiconductor manufacturing processes such as lithography, etching, and deposition. Individuals responsible for equipment operation require a diverse skill set to ensure efficient and accurate performance	i. Setup and Calibration of Equipments, ii. Data interpretation iii. Troubleshooting abilities iv. Safety Protocols and procedures
g.	Quality Assurance	Ensuring compliance with industry standards and product specifications is crucial in the semiconductor industry to maintain product quality, reliability, and safety. Individuals tasked with conducting inspections and quality control tests require specific abilities to assess manufacturing processes accurately and identify deviations from established standards.	i. strong understanding of semiconductor manufacturing processes, materials, equipment, and testing methodologies
h.	Emergency response	Preparedness to handle emergencies related to gas leaks or contamination incidents, including knowledge of emergency	i. Knowledge of Hazardous Gases and Chemicals ii. Familiarity with emergency shutdown procedures iii. Basic first-aid training

		shutdown procedures and first-aid measures	iv. Emergency Response Protocols v. Personal Protective Equipment (PPE) Usage
i.	Regulatory Compliance	In the semiconductor industry, regulatory compliance with health, safety, and environmental standards is paramount to ensure the well-being of personnel, protect the environment, and maintain operational integrity.	i. Compliance with health and safety regulations ii. Compliance with environmental regulations iii. Legal Compliance and Liability Reduction

2.8 Heat Dissipation Solutions

A heat sink is a physical structure designed to absorb and dissipate heat from a semiconductor device through thermal contact, either directly or indirectly. Typically constructed from metals with high thermal conductivity, such as aluminum or copper, heat sinks facilitate efficient heat transfer. Their design often incorporates features such as fins or pins, which increase the surface area and enhance the ability to release heat into the surrounding environment, usually air.

As electronic devices continue to decrease in size while increasing in power, the importance of effective heat sinks becomes even more pronounced. These components are essential in managing heat, ensuring the optimal performance and longevity of semiconductor devices and equipments.

2.9 Supply Chain and Logistics:

Integrated networks for managing the supply of materials and components, as well as the distribution of final products to customers. The semiconductor supply chain is a complex network of companies involved in the design, manufacturing, testing, packaging, and distribution of semiconductors.

a. **Design and Development:** This stage involves research and development (R&D) to create semiconductor designs. Companies work on new chip architectures, functionality, and performance enhancements. Intellectual property (IP) licensing may also occur during this phase, allowing companies to use patented technologies.
b. **Fabrication (Manufacturing):** Once the design is ready, fabrication process begins. This stage takes place in semiconductor fabrication facilities (fab labs). Fabs produce semiconductor Wafers by depositing layers of materials, Etching patterns, and adding dopants to create transistors and other components. Fabrication can take several months, and the process is highly intricate.
c. **Testing and Assembly:** After fabrication, the Wafers undergo testing to identify defects and ensure functionality. The tested Wafers are then cut into individual chips (die) and packaged. Assembly, Testing, and Packaging (ATP)

facilities handle these steps. The Chips attached to packages are tested for quality and distributed.

d. **Distribution:** Efficient logistics and supply chain management are crucial for timely delivery to end users. Distributors play a vital role in distributing semiconductors to various customers, including original equipment manufacturers (OEMs), electronics companies, and other end users. Electrostatic discharge (ESD) can harm semiconductor devices. Packaging materials with ESD protection, such as anti-static bags and trays, are used to safeguard components during handling and transportation.

e. **Additional Considerations:** Recycling and disposal are also part of the supply chain, ensuring responsible handling of semiconductor waste. Supply chain disruptions, such as component shortages or transportation delays, can impact the availability of semiconductors.

The semiconductor supply chain involves coordination across various stages, from design to distribution, to meet the demand for these critical components. Ensuring timely delivery is essential for maintaining customer satisfaction and supporting innovation in various industries.

2.10 Human Resources and Talent Development

Skilled engineers, technicians, scientists, and support staff are critical to the semiconductor industry. Continuous training and development, coupled with global talent acquisition strategies, are essential to sustain innovation and growth in this highly technical field. The semiconductor industry is indeed facing significant talent challenges.

a. **Career Advancement Opportunities**: Providing clear paths for career progression encourages professionals to continually develop their skills and knowledge. Companies should offer opportunities for growth, whether through promotions, lateral moves, or skill-based advancements.

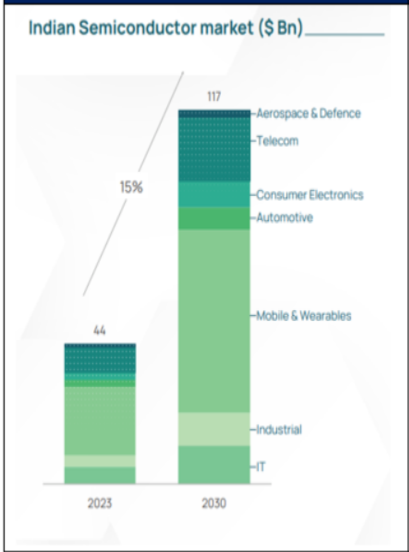
b. **Investment in Training and Development:** Companies should invest in training and development programs to attract new talent and retain existing employees. This includes sponsoring workshops, webinars, conferences, and creating department-specific mentorship initiatives.

c. **Partnerships with Universities:** Collaborating with universities can help cultivate a pipeline of skilled graduates who are ready to meet industry demands. By actively engaging with educational institutions, companies can ensure a steady supply of qualified candidates.

3 India's Electronic System Design and Manufacturing (ESDM) Value Chain

3.1 India's Presence in the ESDM – Semiconductor Value Chain

Indian demand for semiconductors to increase at a healthy pace



India's presence in the front and the back of the supply chain make our foray into semiconductor manufacturing plausible

Value Chain	Design	Semiconductor Manufacturing (Foundry)	Assembly and Testing (OSAT)	PCB Assembly (PCBA)	System level assembly (ODM, EMS)
	Entails chip sizing, layout & transistor linking	Pattern wafers with designed layouts	Package individual IC chips & conduct testing	Assemble packaged IC chips onto PCB	Integrate PCBA with other modules
India's Presence	20% chip designers & engineers based in India	US$18bn of investment approved for OSAT and foundry to be commissioned in phases over CY25- 28		Over last 3Y India has emerged as fastest growing manufacturer in these verticals	
Way Forward	Possible to leverage this talent pool	More large-scale investments in foundries and OSAT are likely to be announced		Indian production expected to grow 3x and exports by 8x in next 4-5 years	

Figure 9 India's presence in Semiconductor Supply Chain

Source: Press Information Bureau (PIB), BCG Analysis. OSAT: Outsourced Semiconductor Assembly and Test, PCBA: Printed Circuit Board Assembly, ODM: Original Design Manufacturer, EMS: Electronic Manufacturing Service, IC Chips: Integrated Circuit Chips

With the government's Investment policies in semiconductor together with conducive regulatory and business environment, India has the potential to play a much more significant role in global semiconductor value chains. Considering India's large and growing consumer and business marketplace, its strengths in electronics production, and global supply chain rebalancing, India can seize this moment to expand its presence in global semiconductor value chains.

In the next five years, India has the potential to expand its presence in the semiconductor assembly, test, and packaging (ATP) segment to as many as five facilities and to attract fabs producing legacy semiconductors at 28 nm or above. Expanding its presence in semiconductor manufacturing would build on India's decades-long experience in semiconductor design, where it accounts for 20 percent of the world's integrated circuit (IC) design workforce, over 125,000 workers.

3.2 India's Semiconductor Industry Distribution in the Value Chain

Figure 10 Major players in Indian Semiconductor Ecosystem

3.3 The Semiconductor Value Chain in India

Semiconductors are the fourth most traded product globally and have one of the most intricate and widely spread value chains of any industry. The entire semiconductor production process encompasses several stages, starting from material procurement to the manufacturing of the final product. This report primarily focuses on four key aspects of the semiconductor production process:

a. Semiconductor research and development (R&D),
b. Chip design,
c. Semiconductor fabrication, and
d. Assembly, Testing, and Packaging (ATP).

Raw Material Sourcing: India has been making strides in securing high-purity silicon, essential for semiconductor manufacturing. The government's initiatives have facilitated partnerships with global suppliers to ensure a steady supply of raw materials, with significant efforts concentrated in New Delhi, Mumbai and other major industrial hubs.

Wafer Fabrication: India has established several Wafer fabrication facilities, with significant investments from both the government and private sector. The recent inauguration of new manufacturing plants in Gujarat and Assam marks a major step forward in enhancing India's capabilities in this area.

Packaging and Testing: India has developed robust packaging and testing facilities to ensure the quality and reliability of semiconductor chips. Companies like HCLTech and Tata Elxsi, which are involved in packaging and testing, have facilities in Bangalore and Pune, are actively involved in this stage, contributing to the growth of the domestic semiconductor industry.

Assembly: The Assembly and Testing of semiconductor chips are being carried out with increasing efficiency. The establishment of new facilities, located in Bengaluru and Pune and the adoption of advanced testing technologies have improved the overall quality and performance of semiconductor products. Micron Technology is contributing to semiconductor assembly in India, with its facility in Bengaluru set to roll out its first made-in-India chips by early 2025.

Distribution: India's semiconductor products are being distributed to various industries, including electronics, automotive, and telecommunications. The government's incentive schemes and supportive policies have encouraged the growth of the semiconductor ecosystem, making India a competitive player in the global market. Semiconductor products are distributed from major industrial centers such as New Delhi, Mumbai, and Bangalore to various industries across India.

3.4 Semiconductor R&D and Design in India

Integrated circuit (IC) design is undoubtedly India’s greatest semiconductor industry strength. The country employs approximately 20 percent of the world’s semiconductor design engineers, or about 125,000 individuals. About 3,000 individual ICs are designed in India each year. In terms of very large-scale integration (VLSI), which refers to the process of creating an IC by combining millions or billions of MOS (metal-oxide) transistors onto a single chip. India accounts for 15 percent of their global production. Almost every one of the world’s top-25 semiconductor design companies, including Intel, Texas Instruments, NVIDIA, and Qualcomm, have design and R&D centers in India. Much of this presence is centered in the south Indian city of Bangalore (Bengaluru) in the state of Karnataka.

Odisha state government signed an MoU with Synopsys, Inc. which has a significant presence in India, employing over 6,000 professionals across major cities, including Bangalore, Hyderabad, Noida, Mumbai, Pune, New Delhi, and Bhubaneswar, to build a collaborative ecosystem focused on semiconductors and Very-Large-Scale Integration (VLSI). This partnership aims to support talent transformation and provide semiconductor-focused research support, aligning with Odisha's ambitions in the semiconductor and electronics sectors. IIT Bombay and IISc Bangalore have signed

MoUs with Synopsys.Inc., on research partnerships, educational software and curriculums, and faculty development programs to support workforce development.

The India Semiconductor Workforce Development Program (ISWDP), a collaboration between the Indian Institute of Science (IISc) and Synopsys, aims to bridge the skill gap by providing comprehensive training in semiconductor design, modeling, simulation, and device development. This initiative is crucial in ensuring that India remains competitive in the global semiconductor market and contributes to the innovation and deployment of next-generation technologies. Additionally, through partnerships with the Indian Government's Chips to Startup (C2S) program and the Synopsys Academic & Research Alliances (SARA), Synopsys is working with over 400 universities to foster talent creation across various semiconductor domains.

In July 2023, Renowned Semiconductor Developer Advanced Micro Devices (AMD) announced a five-year, $400 million investment in India that includes a new campus in Bangalore that will serve as the company's largest design center, as well as the addition of approximately 3,000 new engineering roles, bringing AMD's total workforce in India to nearly 10,000 by 2028.

Beyond IC design, India is also a hub of semiconductor manufacturing equipment design. In 2000, Lam Research Corporation, a U.S. manufacturer of equipment for thin film deposition, plasma etch, photoresist strip, and Wafer cleaning processes, launched Lam Research India. The unit, which now employs over 2,000 Indian workers, focuses on software development and support, hardware engineering, global operations management, and analytics. In particular, Lam India's hardware team designs subassemblies and subsystems for all Lam's product lines required globally.

In June 2023, Lam India announced plans to train up to 60,000 Indian engineers through its Semiverse Solutions virtual fabrication platform to accelerate India's semiconductor education and workforce development goals. In support of the skilling initiative, Lam India signed an MoU with the Centre for Nano Science and Engineering (CeNSE) at the Indian Institute of Science (IISc) in Bengaluru to support skilling of 60,000 Indian engineers. Lam India also proposed a $25 million investment to set up a new lab in the state of Karnataka. In June 2023, Applied Materials, another semiconductor toolmaker, announced plans to invest $400 million over four years to launch a new engineering center in India, which will support more than $2 billion of planned investments and create over 500 new advanced engineering jobs. Malaysia's Spring Semiconductors, in partnership with T-Consult, will train 10,000 Telangana youth in chip design and manufacturing by 2030.The program includes 6 months of training in Telangana followed by 6 months of global internships in Taiwan, South Korea, and Japan. Supported by the Telangana government, this initiative aims to build a skilled semiconductor workforce for India's growing industry.

3.5 Semiconductor Fabrication in India

Tata Electronics is making significant strides in India's semiconductor landscape by establishing a state-of-the-art semiconductor fabrication plant. This ambitious project aligns with India's vision to become a global hub for electronics manufacturing and semiconductor production. The plant is expected to bolster India's capabilities in advanced semiconductor manufacturing, contributing to the growth of the Electronics System Design and Manufacturing (ESDM) sector. By leveraging cutting-edge technology and Tata's vast industrial experience, the facility aims to reduce dependency on imports, enhance self-reliance in semiconductor supply, and create a skilled workforce for the future.

3.6 Semiconductor Assembly, Test, and Packaging (ATP) in India

ATP generally occurs through one of two business models:

a. as in-house ATP services performed by integrated device managers and foundries after fabrication, or
b. by outsourced assembly and test (OSAT) firms, which perform ATP activities for third-party customers. ATP is typically labor intensive and lower value added than design and fabrication, explaining why, historically, firms have set up ATP facilities to a larger extent in developing countries.

4 Overview of the Semiconductor Industry and Workforce

4.1 Industry Activities

As the semiconductor sector plays the pivotal role in the electronic manufacturing segment hence, the industries are also gearing up to play an important role to capture the demand in this upcoming sector.

Table 5 Major Players in Indian Semiconductor Ecosystem

Category	Company Name
Electronic Design Automation (EDA)	Cadence Design Systems, Inc.
	Synopsys, Inc.
	Mentor Graphics Corporation (Now Siemens EDA)
Fabless Semiconductor Companies- Design and Sale with Fabrication outsourced	Qualcomm Inc.
	NVIDIA Corporation
	Broadcom Inc.
	Advanced Micro Devices, Inc. (AMD)
	MediaTek Inc.
FAB - Fabrication	Tata Electronics Private Limited
ATMP- Assembly Testing Marking Packaging	Micron Technology, Inc.
	Tata Electronics Private Limited
	CG Power and Industrial Solutions Limited
	Kaynes Technology India Limited
	Sahasra Semiconductors Private Limited
Integrated Device Manufacturers (IDM)	Intel Corporation
	Samsung Electronics Co., Ltd.
	Micron Technology, Inc.
	Texas Instruments Incorporated
	STMicroelectronics N.V.

4.2 Semiconductor Workforce Demographics

The semiconductor workforce demographics in India are characterized by a diverse spread across various regions of the country, reflecting India's emergence as a prominent player in the global semiconductor industry. Below is detailed overview:

Table 6 Current Scenario in ISM

Region	Key Highlights	Workforce and Key Players	Focus Areas
Gujarat	i. Gujarat's semiconductor growth is driven by	i. Tata Electronics is setting up India's first Fab in Dholera.	i. Semiconductor manufacturing

	strategic initiatives and investments. ii. The state aims to become a hub for semiconductor manufacturing and research.	ii. Micron Technology is establishing its largest ATMP unit in Sanand. iii. CG Power is building an OSAT unit in Gujarat.	ii. Research and development iii. Packaging and assembly (OSAT) iv. Testing and production (ATMP)
Karnataka	i. Policy framework supporting high-tech industries including semiconductor companies. - Strong research and educational ecosystem in Bangalore. ii. It has a vibrant ecosystem for innovation and skill development.	i. Hosts many international companies and startups in the semiconductor space. ii. Presence of renowned research institutions focused on electronics.	i. Research and development ii. Chip design and verification
Andhra Pradesh	i. Hyderabad is a growing semiconductor hub with an increasing presence of key companies and research organizations.	i. Professionals involved in chip design, testing, manufacturing, and application development. ii. Significant contribution to India's semiconductor industry.	i. Chip design ii. Manufacturing iii. Application development
Uttar Pradesh	i. Noida/Greater Noida is emerging as a key semiconductor hub. ii. Government supports infrastructure development and investment incentives.	i. Attracts investments from domestic and international semiconductor companies. ii. Workforce involved in chip manufacturing, R&D, packaging, and assembly.	i. Chip manufacturing ii. Research and development Packaging and assembly
Maharashtra	i. Plans for setting up semiconductor parks and clusters. ii. Policy support for electronics manufacturing services (EMS) and semiconductor companies.	i. Pune and Mumbai are home to semiconductor design companies and educational institutions that focus on semiconductor research.	i. Semiconductor design ii. Embedded systems development iii. Equipment manufacturing

Tamil Nadu	i. The state is focused on creating a conducive environment for semiconductor design and manufacturing. ii. Special incentives for companies in electronics. iii. Chennai hosts semiconductor companies focusing on chip design, verification, and software development.	i. Tamil Nadu offers support for chip design, embedded systems, and electronic manufacturing companies. ii. Various semiconductor startups have emerged here. iii. Workforce includes engineers specializing in VLSI design, FPGA development, verification, and software engineering. iv. Plays a key role in chip design and software integration.	i. Semiconductor design ii. Chip Manufacturing iii. Research and development iv. VLSI and FPGA design v. Chip verification vi. Software development
Telangana	i. Government initiatives focus on attracting semiconductor investments and providing infrastructure support. ii. Offers tax breaks and subsidies.	i. Major semiconductor companies like Qualcomm and AMD have a presence. ii. The state has invested in developing a strong talent pool.	i. Chip design ii. Testing and verification iii. Equipment Manufacturing
Other Regions	Cities like Mumbai, Ahmedabad, Kolkata, and Coimbatore also contribute to India's semiconductor industry.	i. These regions have semiconductor companies, research institutions, and a growing educational ecosystem to support the industry. ii. Diverse semiconductor talent pool across the regions.	Regional focus varies but includes semiconductor R&D, chip design, and manufacturing across industries.

5 Skilling in Semiconductor & Components – Need & Importance

5.1 Current status of skilling in Semiconductor & Components

Investing in a skilled semiconductor workforce is critical for India's economic ambitions. It will address the skill gap to create high-value jobs, improve domestic production, and achieve self-reliance in strategic sectors. This skilled workforce can drive innovation, reduce dependence on chip imports, and contribute to the vision of Atmanirbhar Bharat by promoting exports and attracting foreign investments, ultimately propelling India's economic growth.

a. **Government Initiatives**:

   i. The Indian government has launched various initiatives to boost semiconductor skills, such as the 'Semiconductor Mission' under the Production Linked Incentive (PLI) scheme, which aims to promote manufacturing and skill development in the semiconductor sector.

   ii. The Government has also recognised various Awarding Bodies (ABs) to carry out the skill based training across the nation by developing Qualifications on the future skills such as Semiconductor manufacturing, VLSI etc.

   iii. Programs like the Skill India Program and Pradhan Mantri Kaushal Vikas Yojana (PMKVY) are being leveraged to deliver industry-specific skills.

b. **Industry Collaboration**:

   i. Collaborations between industry and academic institutions are on the rise. Companies like Intel, Qualcomm, and ST Microelectronics are partnering with Indian universities and technical institutes to provide practical training and curriculum support.

   ii. Industry-driven training programs and certifications are increasingly being introduced to align with global standards.

c. **Academic Enhancements:**

   i. The curriculum in engineering colleges and technical institutes is being updated to include more semiconductor-specific courses.

   ii. Specialized programs and postgraduate courses focused on semiconductor technology and VLSI (Very-Large-Scale Integration) design are being introduced.

d. **Training and Development Centers:**

   i. Several dedicated training centers are being set up across the country. These centers provide hands-on experience with semiconductor design and manufacturing tools.

   ii. Centers of Excellence (CoEs) in semiconductor technology are being established to foster research and skill development.

e. **Private Sector Involvement:**

   i. Tech giants and start-ups are investing in skilling programs. For instance, companies are offering internships, apprenticeships, and on-the-job training to build a skilled workforce.

   ii. Online platforms and e-learning courses are being utilized to provide flexible learning options for professionals and students.

f. **International Partnerships:**

   i. India is seeking international collaboration to boost skilling efforts. Partnerships with countries like the USA, Japan, and Taiwan are being explored to gain access to advanced training methodologies and technologies.

   ii. Memorandums of Understanding (MoUs) with global semiconductor leaders are being signed to facilitate knowledge transfer and skill development.

g. **Focus on Emerging Technologies:**

   i. Training programs are increasingly focusing on emerging technologies such as AI, IoT, and 5G, which are heavily reliant on advanced semiconductor components.

   ii. Efforts are being made to integrate these emerging technologies into the existing skilling frameworks to prepare the workforce for future demands.

h. **Outlook and Future Prospects**:

   i. With continuous efforts from both the government and private sectors, India is poised to become a significant player in the global semiconductor market.

   ii. The focus on skilling is expected to yield a more robust, industry-ready workforce capable of driving innovation and growth in the semiconductor and components sector.

5.2 Courses available as part of skilling in National Qualification Register (NQR)

The **National Qualifications Register (NQR)** is a comprehensive database of all qualifications aligned to the National Skills Qualifications Framework (NSQF) in India. It serves as a central repository for information on various qualifications, including their levels, pathways, and Awarding Bodies recognised by NCVET. There are total 67 courses approved by NCVET developed by Awarding bodies like DGT, NIELIT, Electronics sector skill council, Telecom Sector skill council, Medhavi skill university etc. Awarding Bodies in collaboration with Original Equipment Manufacturers(OEM) like ARM Cortex-M0 Design Foundation, SIC- IOT have developed qualifications required for the semiconductor value chain.

Table 7 List of NSQF aligned qualifications

S. No.	Industry /Segment	Name of Qualification / NOS	Level	Occupation	Awarding Body
1.	EDA	Fundamentals of Semiconductor Technology	3.5	Design & Manufacturing	DGT

2.	EDA	Introduction to Semiconductors and Integrated Circuits (ICs)	3.5	Design & Manufacturing	Medhavi Skill University
3.	EDA	Foundation Course in Embedded Application Development	4	Design & Manufacturing	NIELIT
4.	EDA	Foundation Course in VLSI Design	4	Design & Manufacturing	NIELIT
5.	EDA	Foundation of System on Chip (SoC) Design (OEM: ARM Cortex-M0 Design Foundation)	4	Design & Manufacturing	Electronics SSC
6.	EDA	Fundamentals of VLSI Design	4	Design & Manufacturing	NIELIT
7.	EDA	Essentials of RTL Coding for Synthesis	4	Design & Manufacturing	NIELIT
8.	EDA	Essentials of VLSI Circuits Timing Analysis	4	Design & Manufacturing	NIELIT
9.	EDA	Fundamentals of FPGA Architecture and Programming	4	Design & Manufacturing	NIELIT
10.	EDA	Embedded System Junior Developer (O-Level 'Embedded System Design')	4	Product Design	NIELIT
11.	EDA	Chip Design Associate (O-Level 'Chip Design')	4	Product Design	NIELIT
12.	EDA	Semiconductor IC Design Associate	4.5	Design & Manufacturing	Medhavi Skill University
13.	EDA	Certified VLSI Design Engineer	5	Design & Manufacturing	NIELIT
14.	EDA	Embedded Full Stack IoT Analyst	5	Product Design	Electronics SSC
15.	EDA	VLSI Design Engineer	5	Product Design	Electronics SSC
16.	EDA	Embedded Software Engineer	5	Product Design	Electronics SSC
17.	EDA	IoT Hardware Analyst	5	Product Design	Electronics SSC
18.	EDA	Package Design Engineer	5	Product Design	Electronics SSC
19.	EDA	Fundamentals of VLSI Verification	5	Design & Manufacturing	NIELIT
20.	EDA	Essentials of System Verilog and UVM-based Verification	5	Design & Manufacturing	NIELIT
21.	EDA	Fundamentals of Design for Testability for VLSI Circuits	5	Design & Manufacturing	NIELIT
22.	EDA	Fundamentals of VLSI Physical Design and Verification	5	Design & Manufacturing	NIELIT
23.	EDA	Fundamentals of Analog VLSI Design	5	Design & Manufacturing	NIELIT
24.	EDA	Essentials of High-Level Synthesis Programming and Accelerator Design	5	Design & Manufacturing	NIELIT
25.	EDA	Essentials of Python for RTL Verification	5	Design & Manufacturing	NIELIT
26.	EDA	Essentials of SoC Design for Verification	5	Design & Manufacturing	NIELIT
27.	EDA	Embedded System Developer (A-Level 'Embedded System Design')	5	Product Design	NIELIT
28.	EDA	Junior Chip Designer (A-Level 'Chip Design')	5	Product Design	NIELIT

29.	EDA	Semiconductor Process Technology Engineer – Upskilling	6	Product Design	Electronics SSC
30.	EDA	Embedded Product Design Engineer – Technical Lead	6	Product Design	Electronics SSC
31.	EDA	Semiconductor IC Design and Verification Professional	6	Product Design	Medhavi Skill University
32.	ATMP	Die Attach and Wire Bonding Engineer	5	Manufacturing / Production	Electronics SSC
33.	ATMP	IC Package Engineer	5	Manufacturing / Production	Electronics SSC
34.	ATMP	Failure Analysis & Reliability Engineer	5	Quality Assurance	Electronics SSC
35.	ATMP	Quality Analysis & Reliability Engineer	5	Quality Assurance	Electronics SSC
36.	ATMP	Molding Process Engineer	5	Manufacturing / Process	Electronics SSC
37.	ATMP	Saw Singulation - Process Engineer	5	Manufacturing / Process	Electronics SSC
38.	ATMP	Solder Ball Attach – Process Engineer	5	Manufacturing / Process	Electronics SSC
39.	ATMP	Reliability & Quality Control Manager	6	Quality Assurance	Telecom SSC
40.	ATMP	Foundation Program on Nano Science & Technology	6	Design & Manufacturing	Electronics SSC
41.	ATMP	Advanced Program on Nano Science & Technology	6.5	Design & Manufacturing	Electronics SSC
42.	FAB & ATMP	Clean Room Operations - For Semiconductor	4	Semiconductor Processing	Electronics SSC
43.	FAB & ATMP	Essentials of Semiconductor Fabrication Technology	4	Semiconductor Fabrication	NIELIT
44.	FAB & ATMP	Fundamentals of Process Technology and Integration in Semiconductor Fabrication	4	Semiconductor Fabrication	NIELIT
45.	FAB & ATMP	Assembly Process Technician – Wafer Testing	4.5	Manufacturing / Process	Telecom SSC
46.	FAB& ATMP	Semiconductor Technician	4.5	Manufacturing / Process	DGT
47.	FAB & ATMP	Fundamentals of Cleanroom Operations and Safety	4.5	Semiconductor Fabrication	NIELIT
48.	FAB & ATMP	Fundamentals of Photolithography and Mask Making	4.5	Semiconductor Fabrication	NIELIT
49.	FAB & ATMP	Fundamentals of Etching Techniques	4.5	Semiconductor Fabrication	NIELIT
50.	FAB & ATMP	Fundamentals of Thin Film Technology	4.5	Semiconductor Fabrication	NIELIT
51.	FAB & ATMP	Essentials of Device Characterization and Testing	4.5	Semiconductor Fabrication	NIELIT
52.	FAB & ATMP	Essentials of Process Equipment Maintenance and Troubleshooting	4.5	Semiconductor Fabrication	NIELIT
53.	FAB & ATMP	Fundamentals of Design for Manufacturability (DFM)	4.5	Semiconductor Fabrication	NIELIT

54.	FAB & ATMP	Essentials of Semiconductor Assembly, Test, Marking, and Packaging	4.5	Semiconductor Fabrication	NIELIT
55.	FAB & ATMP	Essentials of Supply Chain and Materials Management for Semiconductor Fab	4.5	Semiconductor Fabrication	NIELIT
56.	FAB & ATMP	Essentials of Automation and Process Control in Semiconductor Manufacturing	4.5	Semiconductor Fabrication	NIELIT
57.	FAB & ATMP	Essentials of Semiconductor Production and Quality	4.5	Semiconductor Fabrication	NIELIT
58.	FAB & ATMP	Essentials of New Product Introduction (NPI) in Semiconductor Manufacturing	4.5	Semiconductor Fabrication	NIELIT
59.	FAB & ATMP	Sr. Executive - Business Development	5	After Sales Service	Electronics SSC
60.	FAB & ATMP	Industrial Safety for Semiconductor Manufacturing - Electrical	5	Safety	Electronics SSC
61.	FAB & ATMP	Industrial Safety for Semiconductor Manufacturing - HazChem	5	Safety	Electronics SSC
62.	FAB & ATMP	Laser Marking & Cutting Process Engineer	5	Manufacturing / Process	Electronics SSC
63.	FAB & ATMP	Wafer Back Grinding Engineer	5	Manufacturing / Process	Electronics SSC
64.	FAB & ATMP	Wafer Dicing Engineer	5	Manufacturing / Process	Electronics SSC
65.	FAB & ATMP	Wafer Test and Sort Engineer	5	Manufacturing / Process	Electronics SSC
66.	FAB & ATMP	Assembly Process Supervisor – Wafer Dicing	5.5	Manufacturing / Process	Telecom SSC
67.	FAB & ATMP	Substrate Design and Process Manager	6	Manufacturing / Process	Telecom SSC

5.3 Courses available with IIT, IISc, NIT's and other Institutes

India has made significant strides in the field of semiconductors, and several Indian Institutes of Technology (IITs) and others offer courses related to semiconductor technology.

a. **IISc Bangalore**:

The **Semiconductor Devices and Integrated Circuit Technology** course offered by the Center for Nano Science and Engineering (CeNSE) at IISc covers topics such as band structure, carrier statistics, p-n junctions, MOSFETs, and integrated circuit processing.

b. **IIT Hyderabad**:

IIT Hyderabad offers an M.Tech. program in **Semiconductor Materials and Devices** that covers courses related to semiconductor devices, electronic materials, smart materials, and thin film technology

c. **IIT Madras**

i. IIT Madras and Purdue University have partnered to create a dual-degree master's program in semiconductors named Dual-Degree Master's Program in Semiconductors (Purdue Collaboration).
ii. Fundamentals of Electronic Materials and Devices (NPTEL): The "Fundamentals of Electronic Materials and Devices" course is offered by IIT Madras under the National Programme on Technology Enhanced Learning (NPTEL)
iii. IIT Madras offers an AICTE-approved FDP course titled "Fundamentals of Electronic Materials and Devices".
iv. Integrated Circuits and Systems Group: IIT Madras has an "Integrated Circuits and Systems" group that focuses on VLSI design and related topics.

d. **IIT Roorkee**

IIT Roorkee is offering a full programme with appropriate rigour in the domain of IC manufacturing and VLSI Design

e. **IIT Kharagpur**

IIT Kharagpur is offering Semiconductor Device Modelling and Simulation. This foundation-level course covers semiconductor properties, devices, and governing equations. It aims to develop a sound physical and intuitive understanding of semiconductor devices.

f. **IIT Guwahati**

IIT Guwahati is offering courses like Nano electronics - Fabrication technology, Radio Frequency Integrated Circuits, Photonic ICs, Foundation of System Architecture Design, etc.

g. **Short-Term Courses**:

i. SemiX at IIT Bombay conducts short-term courses on semiconductor technology. For example, they offer a five-day course on Semiconductor Manufacturing and Technology with hands-on training
ii. IIT Delhi offers a hands-on training program on "Semiconductor Device Technology: Fabrication and Characterization" under their Continuing Education Programme (CEP).

5.4 Courses available with AICTE affiliated institutions

The All India Council for Technical Education (AICTE) launched courses to make India self-reliant in chip manufacturing.

a. AICTE has given approval to 489 institutes at the postgraduate level and 114 institutes at the undergraduate level for running VLSI courses for AY 2024-25. Over **15,000 students** are expected to be skilled through these AICTE-approved programs in **chip design, VLSI systems, and semiconductor technologies**.

b. VLSI Model Curriculum Framework: The VLSI model curriculum framework is designed to provide students with comprehensive education in VLSI, encompassing a diverse range of subjects that are vital for success in an ever-evolving discipline.
   i. Semiconductor Devices and Fabrication;
   ii. Analog Mixed Signal & RF Circuits;
   iii. Digital Design and Systems;
   iv. Electronic Design and Automation;
   v. Display Technologies; and
   vi. Semiconductor Packaging comprise thematic focal areas. It has been adopted by 2-3 IIT's as well. This curriculum will enable pupils to emerge as proficient VLSI professionals.

c. **PROFICIENCE** (Professional Advancement Through Skill Upgradation)

   Through this program, AICTE endeavours to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". The National Education Policy (NEP) 2020 provides this opportunity for learning, upskilling, reskilling and enhance employability in the field of engineering. Keeping in view of it, AICTE enables working professionals from industry to undertake short-term, credit-based courses in semiconductor-related emerging technologies. Institutions may allocate 10% supernumerary seats exclusively for such professionals to undergo reskilling alongside regular students, strengthening industry-academia collaboration.

d. AICTE DOCTORAL FELLOWSHIP (ADF) SCHEME 2024-25

It plays a key role in nurturing a strong culture of research and knowledge in emerging areas and chip design as it provides funds to promote collaborative and outstanding peer-reviewed research between technical institutions and industries leading to start-ups. Currently, 50+ universities have applied for this scheme, and 400+ students are aimed to benefit from it.

e. Quality Improvement Programme(QIP)

QIP supports faculty from AICTE-approved institutions in acquiring Master’s and Doctoral degrees in technical fields. A total of 94 QIP Centres are active, and over ₹20.67 crore has been disbursed in scholarships. The scheme helps upgrade teaching and research capabilities relevant to semiconductor and electronics engineering.

f. AICTE-QIP-PG Certificate Programme under QIP Scheme

This initiative aims to train faculty from core engineering disciplines (e.g., EEE, ECE, Mechanical) in emerging semiconductor technologies. This supports faculty readiness for delivering updated semiconductor curricula and project-based learning.

g. Hardware Hackathon

AICTE organizes hardware hackathons with a focus on semiconductor and chip design innovation. These events facilitate industry-academic collaboration, prototype development, and innovation pipelines in semiconductor domains.

h. Grant for Organizing Conference (GOC)

AICTE provides financial support to institutions for conducting conferences on semiconductors, VLSI, EDA, and emerging electronics technologies. These platforms enable knowledge exchange between academia, researchers, and industry experts..

i. NATS 2.0 – Apprenticeship for Semiconductor Roles

Under the National Apprenticeship and Training Scheme (NATS) 2.0, over ₹100 crore has been disbursed to apprentices, including those in semiconductor and electronics sectors. This facilitates hands-on training and employability for young diploma holders and graduates entering chip design, fabrication, and ATMP roles.

6 India's Strategy and Implementation Plan for Capacity Building Across the Semiconductor Value Chain

6.1 Development of Qualifications/Courses

India's strategy for capacity building in the semiconductor and electronics value chain emphasizes the development of industry-relevant qualifications and modular training programs, anchored in a long-term roadmap. However, despite the availability of various courses across engineering institutions and the broader skilling ecosystem, most offerings remain misaligned with the practical skill requirements of fabs, OSATs, and ATMP facilities.

Key process-specific competencies such as Chemical Mechanical Planarization (CMP), photolithography equipment handling, dry etching, metrology operations, and cleanroom safety protocols are either inadequately addressed in most curricula. This creates a significant disconnect between academic training and shopfloor requirements. Additionally, there is a critical absence of stackable, job-role-specific modules mapped to each stage of the semiconductor value chain i.e from design and fabrication to assembly, testing, and packaging. For instance, cleanroom-ready operator training, fab tool simulation labs, and Environment, Health & Safety (EHS) certifications are not standardized or embedded in mainstream engineering and vocational programs.

These gaps underscore the urgent need for modular, simulation-based, and industry-vetted skilling programs, co-developed in partnership with fab equipment manufacturers, OSAT players, and international training providers.

The identified key areas in which talent development is crucial are as follows:

a. **VLSI Design, Verification, and Testing:**

The chip design sector includes areas like Automotive, Communication, Enterprise, Industrial, and Personal Electronics. Courses in VLSI design cover critical aspects such as digital and analog design, HDLs like Verilog and VHDL, and simulation tools. They now extend to advanced topics like system architecture, logic design, verification, and physical design. Courses also emphasize functional and performance compliance, targeting roles in logic design, verification, physical design, and test engineering. The curriculum is designed to enable seamless integration into industry roles with minimal additional training, focusing on specialized areas such as RTL (Register Transfer Level) implementation, Design for Testability (DFT), and Firmware Development.

b. **Fabrication Processes:**

The manufacturing sector, which includes Foundry & ATMP, Display, and Semiconductor R&D, requires specialized courses in fabrication processes. Training programs encompass photolithography, etching, deposition, doping, and packaging, along with semiconductor device architecture, materials, and characterization. They cover evolving technologies such as CMOS, FinFETs, and high k gate dielectrics.

The curriculum is designed to provide practical training on various process technologies, preparing professionals to contribute to silicon foundries and advanced manufacturing processes immediately.

c. ATMP (Assembly, Testing, Marking, and Packaging):

To meet the growing need for skilled professionals in the final stages of semiconductor manufacturing, courses in ATMP are developed to cover aspects of assembly, testing, marking, and packaging. Training focuses on product design to product test workflow, including advanced packaging technologies and methods for ensuring product quality. The aim is to produce talent proficient in assembly processes and quality assurance, ready to support Wafer fabs, display fabs, and ATMP facilities.

d. IoT Technologies:

With the rapid growth of IoT, courses target the development and implementation of connected device ecosystems. Training covers embedded systems, wireless protocols, data analytics, and cloud computing. IoT-focused curricula include modules on IoT fundamentals, application domains, and value propositions, addressing areas such as smart cities, industrial automation, and healthcare. Practical lab work involves developing algorithms for IoT systems, wireless communication, and sensor networks to ensure a skilled workforce capable of designing and deploying IoT-based solutions.

e. Embedded Systems Design:

Embedded systems design forms a core component of modern electronics. Courses in this domain teach the design, programming, and implementation of embedded systems, covering microcontroller architecture, real-time operating systems, interface design, and embedded security. The curriculum also includes advanced modules on system integration, PCB design, and electronic component integration. Specialized training is provided for specific verticals, such as automotive, medical electronics, and industrial applications. The aim is to develop talent equipped to handle the complexities of embedded systems across a range of industry sectors.

f. Advanced Manufacturing Practices (including IoT, Automation, Robotics):

Advanced manufacturing integrates automation, robotics, and IoT into production processes. Courses focus on factory physics, industrial automation, robotics for production efficiency, and sustainable manufacturing practices. They also cover areas such as supply chain management, project management principles, and high-tech manufacturing fundamentals. Training prepares professionals for roles in smart manufacturing systems, e-waste management, and the application of IoT and automation in production settings.

6.2 Proposed Action Plan for Workforce Development

To address both immediate and long-term objectives for the development of India's semiconductor workforce, the proposed plan presented below has been formulated to dynamically respond to the rapid shifts within the semiconductor industry. These strategic initiatives, which are being driven by prominent global and domestic corporations, are essential for establishing India as a central player in the global semiconductor industry. They are designed to not only meet local needs but also to integrate India into the global semiconductor supply chains, thereby improving the nation's technological and manufacturing capabilities.

Table 8 Timelines for skilling

Year	Q1-Q2	Q3-Q4
2025	Initiate an accelerated training program focused on foundational skills in semiconductor manufacturing, addressing the surge in industry setups in Assam and Gujarat. Focus on vocational training for operators and maintenance roles, as these are critical in the early stages of new facilities.	Expand training programs to include advanced semiconductor design and fabrication techniques, aligning with Micron's establishment of a Center of Excellence in Bengaluru. Begin collaborations with industry leaders to ensure course relevancy.
2026	Introduce specialized courses in semiconductor packaging and testing, responding to the operational needs of the new Tata Electronics semiconductor assembly and test unit in Tamil Nadu.	Implement on-the-job training modules in partnership with industry players like Intel and Texas Instruments, which have significant design and research operations in India.
2027	Focus on scaling up the manufacturing engineering and process engineering training, crucial for the upcoming facilities and expansions, especially for roles requiring a high degree of technical expertise.	Develop leadership and management training for mid and senior-level professionals to support the growing managerial needs within the expanded operations of companies like Samsung and Texas Instruments in India.
2028	Enhance R&D skills development, targeting innovations in semiconductor technologies. Collaborate with academic institutions and research centers to integrate cutting-edge research into the curriculum.	Address the specific needs for automation and control systems as outlined in the SemiconIndia report, preparing personnel for roles in factory automation and control systems crucial for new manufacturing setups.
2029	Continue with advanced technical training in areas such as photonics technology, CMOS integration, and key optical components, vital for	Expand training on supply chain management and quality control, crucial for the sustainability of

	maintaining competitiveness in high-tech semiconductor manufacturing	manufacturing operations as per industry standards and demands.
2030	Review and revise the skilling programs to align with the latest technological advancements and market demands. Focus on continuous improvement and adaptation of the curriculum to meet future needs.	Strengthen collaborations with international semiconductor hubs to foster knowledge exchange and benchmark against global best practices in semiconductor manufacturing and design.

The above suggested skilling plan may be accelerated based on industry demand and readiness.

6.3 Proposed Skill advancements

Semiconductor technology is a rapidly evolving field that requires a strong foundation in various disciplines. By understanding the core principles of physics, chemistry, electrical engineering, and computer science, a learner can build a solid base for exploring semiconductor devices, fabrication processes, design techniques and gradually delving into more specialized areas such as nanotechnology, materials science, and circuit design. This knowledge progression provides a roadmap for individuals interested in pursuing a career in semiconductor technology.

6.3.1 For ITI & Diploma

a. Foundational Electronics: Building a strong base in electronics principles, circuit analysis, and digital systems.
b. Fabrication Processes: Understanding basic semiconductor fabrication techniques like Lithography, etching, deposition, doping, packaging. and cleanroom procedures and safety protocols.
c. Introduction to Chip Design: Exploring fundamental concepts of chip design, including logic gates and basic CAD tools.
d. Introduction to Semiconductor Testing like Testing procedures, equipment, and analysis.
e. Introduction to Quality Control: Quality assurance methods and standards in semiconductor manufacturing.

6.3.2 UG & PG

a. Some of the above courses given for ITI & Diploma may also be done for UG Programmes.
b. Deep Skilling: Specialization in specific areas like VLSI design, microelectronics, or device physics.
c. Offering specialized programs in collaboration with universities, leveraging their faculty and research infrastructure (e.g., Semiconductor and MEMS Design and Fabrication courses with IITs, NITs, Central/State Universities).
d. Hands-on Learning: Gaining practical experience through industry-standard design tools and virtual fabrication simulations, preparing students for the real world without needing cleanroom facilities.

Table 9 Knowledge progression for Graduates

Undergraduate Level	Postgraduate Level
Core Courses • Solid-state physics • Quantum mechanics • VLSI Design • Digital and Analog circuit design • Microprocessors and microcontrollers • Semiconductor device physics • Materials science	**Core Courses** • Advanced semiconductor device physics • Semiconductor fabrication technology • Semiconductor materials • Device modeling and simulation • Integrated circuit design • Cleanroom processes & handling
Specialized Courses (electives): • VLSI design • Nanotechnology • Optoelectronics • Power electronics • Embedded systems	**Specialized Courses (electives):** • Analog and mixed-signal circuits • RF and microwave circuits • MEMS (Micro-Electro-Mechanical Systems) • Quantum computing • Neuromorphic computing

6.3.3 Research

In the rapidly evolving semiconductor manufacturing industry, a well-structured knowledge progression is crucial for equipping research students and professionals with the expertise needed to drive innovation and meet industry demands. This pathway involves mastering a range of specialized areas as follows.

a. Semiconductor Physics: Band theory, carrier transport, and device physics. Materials science for semiconductors.
b. Device Design and Simulation: CAD tools for circuit design and simulation. Optimization techniques for performance and power efficiency.
c. Fabrication Technology: Advanced fabrication techniques (e.g., nanolithography, atomic layer deposition). Process integration and yield improvement.
d. Advanced Packaging Technologies like fan out, 3D, System-in packaging techniques.
e. Emerging Technologies: Nanotechnology, quantum computing, and neuromorphic computing

6.3.4 For Working Professionals

Developing expertise in the semiconductor industry involves a structured progression of knowledge and skills. Below are the key stages and areas of focus for working professionals looking to advance in this field:

Table 10 Knowledge progression for Working professionals

Fundamental Knowledge	Intermediate Knowledge
• Basics Electronics & Circuit Design • Semiconductor Physics	• Analog & Digital Design • VLSI Design Principle • EDS Tool Proficiency
Advanced Expertise	**Specialized Areas**
• Microfabrication Techniques • Advanced Semiconductor Design • System-on-chip Design • Testing	• Low Power Design • RF and Mixed Signal Design • Embedded Systems
Expert and Leadership Roles	
• Project Management and Leadership • Research & Development • Mentorship & Training	

6.3.5 For School students

Introducing school students to the semiconductor sector can spark interest in technology and engineering careers early on. The suggested knowledge progression to guide students through this field from basic concepts to more advanced topics is as follows.

Table 11 Knowledge progression for School Students

S. No.	Topics	Modules
a.	Basic Science and Mathematics	<u>Physics Fundamentals:</u> • Basic principles of electricity and magnetism. • Understanding of circuits, voltage, current, and resistance. <u>Mathematics Skills:</u> • Foundational arithmetic, algebra, and geometry. • Introduction to calculus and trigonometry.
b.	Introduction to Electronics	<u>Basic Electronic Components:</u> • Learning about resistors, capacitors, diodes, and transistors. • Simple circuit building using breadboards. <u>Basic Circuit Theory:</u> • Ohm's Law and Kirchhoff's Laws. • Series and parallel circuits.
c.	Intermediate Concepts	<u>Digital Electronics:</u> • Understanding binary numbers and basic logic gates (AND, OR, NOT). • Simple digital circuits and truth tables.

		<u>Semiconductor Basics:</u> • Introduction to semiconductors and how they work. • Concept of p-type and n-type materials.
d.	Hands-on Projects	<u>Simple Projects:</u> • Building basic electronic projects like LED blinkers, simple alarms, and timers. • Using microcontrollers like Arduino for simple programming and automation. • Assembly process for products such as laptops/mobiles <u>Robotics and Automation:</u> • Basic robotics kits to build simple robots. • Introduction to sensors and actuators.
e.	Advanced Topics for High School Students	<u>Advanced Circuit Design:</u> • Designing more complex circuits using integrated circuits (ICs). • Introduction to PCB (Printed Circuit Board) design. <u>Introduction to Programming:</u> • Basic programming skills using languages like Python or C++. • Writing simple programs to control electronic components
f.	Exploring Semiconductor Technology	<u>Transistors and Amplifiers:</u> • Detailed study of how transistors work. • Basic amplifier circuits and their applications. <u>Introduction to VLSI (Very-Large-Scale Integration):</u> • Basic concepts of VLSI and its importance. • Overview of how chips are designed and fabricated.
g.	Career Awareness and Industry Exposure	<u>Field Trips and Workshops:</u> • Visits to local electronics companies or research labs. • Participation in workshops and science fairs focused on electronics and semiconductors.

6.4 Infrastructure Development

India's goal to become a global hub for semiconductor design, manufacturing, and assembly requires the parallel development of a skilled workforce. Alongside curriculum alignment and capacity building, this demands strong infrastructure across educational, skilling, and research institutions.

The infrastructure requirements for development of workforce for semiconductor value chain are mentioned below.

Table 12 Infrastructure requirements for value chain

Component	Infrastructure Requirements
Design	Design software, prototyping facilities, simulation tools, collaboration platforms
Fabrication	Cleanroom facilities, photolithography equipment, etching equipment, deposition equipment, implantation equipment, metrology equipment, inspection equipment, utilities (water, gases, power), wastewater treatment
Cleanroom	ISO Class 3, Class 4, and Class 5 cleanrooms, Heating, Ventilation, and Air Conditioning (HVAC) system, temperature and humidity control, vibration isolation, air filtration systems
Assembly	Assembly machines, bonding equipment, packaging materials, quality control equipment
Testing	Test equipment (probers, testers), calibration facilities, data analysis tools
Packaging	Packaging materials, sealing equipment, labelling machines, quality control equipment

Table 13 Infrastructure requirement for workforce development

S. No	Infrastructure	Requirement
a.	Educational and Training Infrastructure	i. Introduce core courses in semiconductor physics, device fabrication, VLSI design, and CAD tools; To mandate Hands-on Training in semiconductor fab technology via practical training in cleanrooms and fabrication labs. ii. **Vocational Training Centers and ITIs** to train students specialize in semiconductor manufacturing technician; To Cover topics like Wafer handling, die bonding, packaging, process control, and quality assurance; To partner with semiconductor fabs for on-the-job training.

b.	Industry Collaboration and Incubation Infrastructure	i. Joint Research and Development Centres need to established in collaboration with Global leaders in semiconductor manufacturing to focus on research projects aligned with industry needs. ii. To establish Incubation Centers with specialized Facilities including cleanrooms, prototyping equipment, and access to industry experts to offer mentorship, networking, and funding opportunities for startups.
c.	Infrastructure for Advanced Learning and Skill Development	i. Providing access to popular software like EDA tools (Cadence Virtuoso, Synopsys Custom Compiler) and logic simulation tools (ModelSim, QuestaSim) for chip design. Offering software-based insights into various stages of chip manufacturing, helping students. ii. High-Performance Computing (HPC) Cluster enabling efficient simulation of complex VLSI designs for real-world project work. iii. Develop Virtual Cleanrooms for hands-on experience.
d.	Supporting Infrastructure	i. **Multiple Fabs:** Establish fabs within academic institutions for various technology nodes, including advanced nodes(sub-10 nm) so as future workforce gets access to equipment for photolithography, Electron Beam Lithography (EBL), Chemical Vapor Deposition and atomic layer deposition (ALD) Equip fabs with tools for deposition (CVD, ALD), lithography (optical, EBL), etching (plasma, wet), and metrology. ii. **Labs:** Equip labs with equipment for prototyping and pilot manufacturing to support small-scale fabrication, such as mask aligners and plasma etchers. Incorporate courses on prototyping methodologies and process optimization. Establish labs for testing and certification against global standards. iii. Access to World Class (Class 100) Cleanrooms to Ensure cleanroom environments meet industry

		standards. Equip with state-of-the-art fabrication tools for various processes (lithography, deposition, etching). iv. Invest in material synthesis tools like atomic force microscopes, X-ray diffraction (XRD), transmission electron microscopes (TEM) and high-throughput experimentation infrastructure, allowing researchers to quickly explore a wide range of materials and processing conditions to identify the most promising elements for semiconductor applications.

6.5 Training of Trainers / Assessors

To build instructional capacity across the semiconductor skilling ecosystem, a structured Training of Trainers/Assessors (ToT/A) program is necessary with a focus on process-intensive, cleanroom-ready, and design-aligned job roles. The program needs to target faculty members from engineering institutions, ITIs, polytechnics, and short-term skilling partners delivering semiconductor-related qualifications as conducted by AICTE though ATAL scheme given below.

The ToT/A program is required to be aligned to NSQF levels and will cover specialized modules such as photolithography, CMP, wafer inspection, bonding and packaging, functional test development, EDA tool usage, and cleanroom protocols. Trainers will undergo blended learning including simulation-based training, industry exposure, and assessment-based certification.

To ensure industry relevance, the program needs to be implemented in collaboration with Original Equipment Manufacturers, OSAT partners, and leading academic institutions.

In this regard, AICTE has been conducting various Faculty Development Programs (FDPs) for imparting/upgrading faculty knowledge in emerging thrust areas like IoT, ML, AI, robotics, block-chain, renewable energy, AR/VR, etc.

a. AICTE Training and Learning (ATAL) Scheme

ATAL Cell (Training and Learning Bureau) collaborated and invited experts from various leading corporates such as ARM India, Cadence Design Systems, Adobe, Ford Motors, Google, Amazon, Metaverse, Tata Energy, LinkedIn, TCS, Wipro, Infosys, etc. and launched 'TechSaksham' program with Microsoft and SAP. ATAL Academy in collaboration with ARM India Ltd. conducted a FDP on 'Embedded systems-an application driven approach. A.Y 2022-23, ATAL Scheme has sanctioned 441 FDPs in various emerging areas in face to Face mode with 22,539 registered and 15,341 certified participants.

Table 14 FDP conducted by AICTE

Academic Year	FDP Conducted	Faculty Trained
2020-21	123	13,601
2021-22	167	14,981
2022-23	27	624
2023-24	84	2,906
Grand Total	401	32,112

b. **FDP's in Semiconductor in Regional Languages:** FDP's in regional languages for semiconductor play a critical role in building a skilled workforce and make sure that educators from diverse linguistic backgrounds can effectively participate and get benefit from advanced training. AICTE has conducted many FDP'S in semiconductor in regional languages.

Table 15 FDP by AICTE in regional language

S.No.	AICTE-PID Number	Regional Language in which program is proposed	Areas for Conference/Seminar/Workshops	No. of Days of Program	Date of Conference	Name of the Institution with State
1	1-10311411	Urdu	Semiconductors	2	28-10-2024	St.Mary's Engineering College, Telangana
2	1-4571491	Punjabi	Semiconductors	2	06-06-2024	Baba Farid College of Engineering & Technology Bathinda, Punjab
3	1-8811246	Marathi	Semiconductors	3	23-07-2024	G H Raisoni Institute of Engineering and Technology, Nagpur, Maharashtra
4	1-3669181121	Hindi	Semiconductors	2	20-09-2024	SRM Institute of Management and Technology, Delhi-NCR Campus, Ghaziabad, Uttar Pradesh
5	1-6174801	Bengali	Semiconductors	2	21-11-2024	Guru Nanak Institute of Technology , West Bengal
6	1-17097385	Assamese	Semiconductors	3	16-12-2024	Girijananda chowdhury University, Assam

Collaboration with industries and small and medium enterprises (SMEs) across the value chain shall be facilitated for the implementation of Training of Trainers (ToT) and Faculty Development Programmes (FDPs). Partnerships with international organisations shall also be established to enable knowledge transfer and capacity building.

7 Recommendations & Way Forward

India's growing semiconductor ecosystem, combined with strategic initiatives, positions it well to attract global semiconductor companies and contribute significantly to the industry's growth. Detailed Recommendations and Implementation Plan from the Committee Report:

a. Project-Based Learning and Internships:

i. Recommendation: Development of project-based learning courses for Higher Education Institutions (HEIs) to be integrated into curriculum and summer internship programs for undergraduate (UG) students. These courses should also be considered for postgraduate (PG) students.

ii. Implementation: AICTE and universities should collaborate to create standardized course modules that focus on real-world semiconductor problems. Institutions can partner with semiconductor companies to provide students with industry-driven projects. Regular feedback from industry partners will ensure alignment with current trends.

b. Specialized Semiconductor Courses:

i. Recommendation: AICTE recognised bodies should introduce new courses in semiconductor development under the SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds) platform. Upskilling and faculty development programs for both academic professionals and industry leaders should also be established.

ii. Implementation: AICTE, in partnership with leading semiconductor experts, shall design these courses. Faculty development programs will include workshops, certifications, and training sessions, ensuring teachers are equipped to deliver the curriculum. Industry professionals will also be encouraged to participate in these programs for continuous skill advancement.

c. Nationwide Hackathons and Challenges:

i. Recommendation: Organize hackathons and grand challenges to stimulate student interest in the semiconductor sector at state and national level.

ii. Implementation: AICTE and other regulators should partner with industry leaders and other agencies to host these events annually. Prizes, internships, and job offers can serve as incentives. Winners of these events may be offered scholarships or positions in advanced research projects or industries.

d. Online Learning Modules and Self-Paced Learning:

i. Recommendation: Develop modular, self-paced online courses such as nano-credentials, micro-credentials or National Occupational Standards (NOS)s on semiconductor design and development, supplemented by lab exercises. These courses should be offered on platforms like SIDH and SWAYAM.

ii. Implementation: AICTE and other regulators must collaborate with leading educational platforms to develop these courses. Institutions will be encouraged to include these online modules as part of their elective offerings, ensuring students gain both theoretical and practical knowledge. Virtual labs and simulation tools will provide hands-on experience.

e. **Curriculum Specialization in VLSI Design:**

   i. Recommendation: Introduce a specialized degree in VLSI (Very-Large-Scale Integration) Design, ensuring that foundational semiconductor courses are covered in the first two years of engineering. Semiconductor design electives should be offered in the 3rd and 4th years, with a strong focus on practical training during the final year.
   ii. Implementation: AICTE should work with universities to redesign engineering curricula, integrating semiconductor-focused courses and ensuring that prerequisites are completed in the first two years. Practical training will be provided through industry partnerships, with students working on real-life projects and spending time in semiconductor labs.

f. **Strengthening Industry-Academia Collaboration:**

   i. Recommendation: Enhance partnerships between industry and academia to ensure coursework and practical training remain aligned with technological advancements in the semiconductor industry.
   ii. Implementation: Institutes will establish industry-academia exchange programs, where industry experts contribute to teaching and research. In return, companies can benefit from research outcomes, skilled interns, and the development of future talent. Special funding and incentives from the Ministry of Education and Ministry of HRD will promote these partnerships.

g. **Virtual Platforms for Reskilling Programs:**

   i. Recommendation: Utilize virtual platforms like SWAYAM and DIKSHA to provide reskilling and upskilling programs for students from Tier-2 and Tier-3 colleges, ensuring broader access to quality education.
   ii. Implementation:

      A. AICTE will create digital modules with varying difficulty levels, designed to cover semiconductor basics to advanced topics. These platforms will offer flexible learning options for students and professionals, with a focus on practical lab work conducted through virtual labs or university labs.
      B. Courses approved by NCVET and listed on the National Qualifications Register (NQR) shall also be uploaded to Skill India Digital Hub (SIDH) by the NCVET recognised Awarding Bodies for public access

h. **Support for Women in STEM Careers:**

   i. Recommendation: Establish programs that help women re-enter the workforce after mid-career breaks and reduce attrition by providing reskilling and returnship opportunities in the semiconductor industry.
   ii. Implementation: Government policies should mandate companies to use Corporate Social Responsibility (CSR) funds to sponsor women’s participation in reskilling programs and internships. Specialized scholarships and management training for women will be developed, ensuring that they have equal access to semiconductor careers.

i. Strengthening the STEM Talent Pipeline:

i. Recommendation: MEITY and the Ministry of Education should focus on expanding and advancing STEM education to build a robust pipeline of engineers and scientists. This will involve promoting STEM subjects and addressing affordability barriers for students.
ii. Implementation: Scholarships and grants should be expanded for students pursuing STEM fields, particularly in underrepresented communities. STEM education will be integrated more deeply into school curriculums, encouraging students to pursue careers in the semiconductor sector.

j. Apprenticeship and Skill Development Programs:

i. Recommendation: The Ministry of Skill Development should train 100,000 new technicians through apprenticeships, career pathway programs, and career and technical education programs, tripling the number of graduates in semiconductor-related fields.
ii. Implementation:

A. Apprenticeship programs will be developed in collaboration with the semiconductor industry and ITIs. Students will receive both classroom instruction and on-the-job training in semiconductor design, manufacturing, and testing. Industry mentors will guide them through hands-on experience in real-world settings.
B. Apprenticeship programs can be explored in the areas of semiconductor value chain mentioned in Section 4.1 of this report. In addition to this, degree apprenticeship programs can be developed in collaboration with the major players in the domain mentioned in the section 4.1.

k. Degree Apprenticeships and Blended Programs:

i. Recommendation: Explore degree apprenticeships and blended academic-industry programs that combine theoretical and on-the-job training (OJT) for advanced chip design and manufacturing.
ii. Implementation: AICTE and major semiconductor companies will co-design apprenticeship programs, where students alternate between classroom study and full-time work placements. These programs will help students gain direct industry experience while completing their degrees.

l. Certification for Industry Professionals:

i. Recommendation: Establish AICTE certification programs to validate the skills of professionals in the semiconductor industry, contributing to a larger pool of skilled workers.
ii. Implementation: Certification programs will be developed in consultation with industry experts to ensure alignment with the latest technologies and trends. Industry-recognized certifications will boost employability and career growth for professionals.

m. Public-Private Partnerships for R&D:

i. Recommendation: Encourage Public-Private Partnerships (PPP) in Research & Development (R&D) to foster innovation in semiconductor technologies, and collaborate with universities to create entrepreneurial ecosystems.
ii. Implementation: AICTE and industry will set up R&D centers at selected universities, providing funding and resources for semiconductor innovation. These centers will act as incubation hubs for student-led startups and research projects, encouraging entrepreneurship and technological advancement.

n. Specialized Training Institutes for Semiconductors:

i. Recommendation: Establish dedicated training centers to offer specialized education and hands-on training in semiconductor manufacturing, design, and testing.
ii. Implementation: New training institutes, modelled after global semiconductor centers of excellence, will be developed across India. These institutes will provide cutting-edge lab facilities, ensuring that students receive practical experience alongside their theoretical studies.

o. Lifelong Learning and Continuous Development:

i. Recommendation: Promote lifelong learning and continuous professional development through workshops, online courses, and seminars on emerging semiconductor technologies.
ii. Implementation: Continuous education programs should be offered on various platforms for professionals to stay updated on the latest semiconductor innovations. Industry leaders will contribute to these programs by offering expert-led seminars, hands-on workshops, and access to the latest tools and methodologies.

Annexure 1

List of all the OEMs as per the value chain

1. Design & Intellectual Property (IP) R&D

- Arm Holdings
- Cadence Design Systems
- Synopsys
- Imagination Technologies

2. EDA (Electronic Design Automation) Tools

- Mentor Graphics (a Siemens Business)
- Cadence Design Systems
- Synopsys
- Ansys

3. Chip Manufacturing (Foundries) FAB

- TSMC (Taiwan Semiconductor Manufacturing Company)
- Samsung Electronics
- GlobalFoundries
- Intel (also a major IDM - Integrated Device Manufacturer)
- SMIC (Semiconductor Manufacturing International Corporation)

4. IDMs (Integrated Device Manufacturers)

- Intel
- Samsung Electronics
- Micron Technology
- Texas Instruments
- STMicroelectronics

5. Fabless Companies

- Qualcomm
- NVIDIA
- Broadcom
- AMD (Advanced Micro Devices)
- MediaTek

6. Equipment Manufacturers

- ASML (lithography machines)
- Applied Materials
- Lam Research
- KLA Corporation

7. Materials Suppliers

- Shin-Etsu Chemical
- SUMCO
- Dupont
- BASF
- Dow Chemical

8. Assembly, Test, and Packaging (OSAT)

- ASE Technology Holding
- Amkor Technology
- JCET (Jiangsu Changjiang Electronics Technology)
- SPIL (Siliconware Precision Industries)

9. End-Product Manufacturers

- Apple
- Samsung Electronics
- Sony
- Huawei
- Dell Technologies
- HP Inc.
- Lenovo

Annexure 2

<u>Details of basic and fundamental courses for school students</u>

1. Introduction to Semiconductors

- Overview of Semiconductors:
- Definition and importance in modern technology.
- Applications in everyday devices like smartphones, computers, and household electronics.
- History of Semiconductors
- Key historical milestones.
- Evolution from vacuum tubes to modern semiconductor devices.

2. Basic Physics and Chemistry of Semiconductors

- Atomic Structure
- Basics of atoms, electrons, and energy levels.
- Understanding elements like Silicon and Germanium.
- Electrical Properties:
- Difference between conductors, insulators, and semiconductors.
- How semiconductors uniquely balance conductivity and insulation.

3. Semiconductor Materials

- Types of Semiconductors
- Intrinsic (pure) and extrinsic (doped) semiconductors.
- How doping changes electrical properties.
- Doping Process
- Introduction to n-type and p-type semiconductors.
- Role of impurities in modifying conductivity.

4. Basic Semiconductor Devices

- Diodes
- Structure, function, and real-world applications.
- Transistors
- Types (Bipolar Junction Transistors, Field-Effect Transistors).
- Their role in amplifying and switching electronic signals.
- Integrated Circuits (ICs):

- Basics of ICs and their importance in miniaturizing electronics.

5. Fundamental Electronics

- Electric Circuits:
- Understanding voltage, current, and resistance (Ohm's Law).
- Basic circuit components: resistors, capacitors, and inductors.
- Basic Circuit Design:
- Designing simple circuits.
- Hands-on activities with breadboarding.

6. Digital Electronics Basics

- Binary System
- Introduction to binary numbers and their significance in digital electronics.
- Logic Gates
- Basic logic gates (AND, OR, NOT, NAND, NOR) and their functions.
- Simple logic circuits and their applications.

7. Applications of Semiconductors

- Consumer Electronics
- Role of semiconductors in devices like smartphones, tablets, and home appliances.
- Automotive
- Impact on modern vehicles: sensors, control systems, and infotainment.
- Telecommunications
- Importance in communication technologies: 5G, Wi-Fi, and internet infrastructure.

8. Hands-On Projects and Experiments

- Basic Electronic Kits:
- Building simple projects: LED circuits, basic sensors, small robots.
- Simulation Software:
- Using tools like Tinkercad and Multisim for circuit design and simulation.

9. Careers in the Semiconductor Industry

- Industry Overview:
- Economic impact and scope of the semiconductor industry.
- Career Paths:
- Various roles: design, manufacturing, research, and development.

- Insights from industry professionals through guest lectures and interviews.

10. Future Trends and Innovations

- Emerging Technologies:
- Introduction to areas like quantum computing and nanotechnology.
- Sustainable Technologies:
- Role of semiconductors in renewable energy and environmental sustainability.
- Course Structure
- Duration: Each course module can be structured to last 4-6 weeks.
- Assessment: Regular quizzes, hands-on project evaluations, and final presentations.
- Resources: Textbooks, online modules, electronic kits, and access to simulation software.
- By covering these fundamental aspects, school students can gain a solid foundation in the semiconductor field, preparing them for more advanced studies and sparking interest in STEM careers.

NIELIT Courses: The National Institute of Electronics and Information Technology (NIELIT) offers a range of courses aligned with the National Skills Qualification Framework (NSQF) and customized programs catering to specific industry needs.

List of NSQF aligned courses

Sl. No.	Name of the Course	Level	Duration (hours)
1	Foundation course in Embedded Application Development	4	90
2	Foundation course in VLSI Design	4	90
3	Certified VLSI Design Engineer	5	480
4	Embedded System Junior Developer (O-Level 'Embedded System Design)	4	450
5	Embedded System Developer (A-Level 'Embedded System Design')	5	780
6	Chip Design Associate (O-Level 'Chip Design')	4	450
7	Chip Designer (A-Level 'Chip Design')	5	780

List of customized courses

Sl. No	Name of the Course	Duration (in hours)
1	VLSI Fundamentals	65
2	VLSI Verification Fundamentals	65
3	Hardware Modelling using Verilog HDL	65
4	FPGA Architecture and Programming	65
5	ARM-based SoC Design	65
6	Advanced ARM Processors based SoC Design	65
7	SoC Verification	65
8	Static Timing analysis	65
9	VLSI Design for Testability	65
10	High Speed Digital Design	65
Embedded Systems		
1	Embedded C and ARM Cortex Microcontrollers	65
2	Embedded Linux	65
3	Embedded RTOS	65
4	Internet of Things	65
5	Industrial IoT	65
6	Industrial Electronic Product Design	65
7	Advanced ARM Processors and OS Porting	65
Beginner level Programmes in the areas of VLSI and Embedded		
1	Embedded for Beginners	30
2	VLSI for Beginners	30
3	Python for Beginners	30
4	Introduction to MATLAB & Simulink	30
5	MicroPython for Beginners	30
6	RISC-V programming primer	30
7	Machine Learning using Python	30
8	Data Analysis Using Python	30

PG Programs (Online)		
1	PG Program in Embedded System Design & IoT	600
2	PG Program on VLSI SoC Design and Verification	600
Internship / Industrial Training Programs		
1	Internship program on Embedded Systems and IoT	120
Online Workshops		
1	Lab Workshop on VLSI Fundamentals - Batch IV	65
2	Lab Workshop on Embedded RTOS - Batch III	65
3	Lab Workshop on Embedded Linux- Batch III	65

Courses available as part of skilling in NQR

S. No.	Name	Level	Duration
1	Foundation course in Embedded Application Development	4	90
2	Foundation course in VLSI Design	4	90
3	Certified VLSI Design Engineer	5	480

Annexure 3

List of AICTE Colleges empaneled for running Semiconductors Skilling Courses:

S.NO	CURRENT INSTITUTE NAME	STATE	INSTITUTE DISTRICT
1	CSMSS CHH. SHAHU COLLEGE OF ENGINEERING	MAHARASHTRA	AURANGABAD
2	GODAVARI COLLEGE OF ENGINEERING	MAHARASHTRA	JALGAON
3	DR BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY LONERE	MAHARASHTRA	RAIGAD
4	SRI VENKATESWARA COLLEGE OF ENGINEEIRNG & TECHNOLOGY	TAMIL NADU	THIRUVALLUR
5	VIDYAVARDHINI'S COLLEGE OF ENGINEERING AND TECHNOLOGY	MAHARASHTRA	THANE
6	LENDI INSTITUTE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	VIZIANAGARAM
7	SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	ANANTAPUR
8	NAGAJI INSTITUTE OF TECHNOLOGY & MANAGEMENT, GWALIOR	MADHYA PRADESH	GWALIOR
9	GITA AUTONOMOUS COLLEGE, BHUBANESWAR	ODISHA	KHORDHA
10	KARPAGAM COLLEGE OF ENGINEERING	TAMIL NADU	COIMBATORE
11	LALJIBHAI CHATURBHAI INSTITUTE OF TECHNOLOGY	GUJARAT	MEHSANA
12	INSTITUTE OF TECHNOLOGY AND MANAGEMENT	UTTAR PRADESH	GORAKHPUR
13	LLOYD INSTITUTE OF ENGINEERING AND TECHNOLOGY	UTTAR PRADESH	GAUTAM BUDDHA NAGAR
14	INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN	DELHI	CENTRAL DELHI
15	APOLLO ENGINEERING COLLEGE	TAMIL NADU	KANCHIPURAM
16	MOHAMED SATHAK A.J COLLEGE OF ENGINEERING	TAMIL NADU	KANCHIPURAM
17	JSPM'S BHIVARABAI SAWANT INSTITUTE OF TECHNOLOGY & RESEARCH	MAHARASHTRA	PUNE
18	SIR C R REDDY COLLEGE OF ENGINEERING	ANDHRA PRADESH	WEST GODAVARI
19	HERITAGE INSTITUTE OF TECHNOLOGY	WEST BENGAL	SOUTH 24 PARGANAS
20	ODISHA UNIVERSITY OF TECHNOLOGY AND RESEARCH	ODISHA	KHORDHA
21	COIMBATORE INSTITUTE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	COIMBATORE
22	SRI SUNFLOWER COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	KRISHNA
23	AMRITA VISHWA VIDYAPEETHAM COIMBATORE CAMPUS	TAMIL NADU	COIMBATORE
24	RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY	KERALA	ERNAKULAM
25	RAGHU ENGINEERING COLLEGE	ANDHRA PRADESH	VISHAKHAPATNAM
26	R.V. COLLEGE OF ENGINEERING	KARNATAKA	BANGALORE URBAN
27	RAO BAHADUR Y MAHABALESWARAPPA ENGINEERING COLLEGE	KARNATAKA	BELLARY
28	SRI CHAITANYA - DJR COLLEGE OF ENGINEERING	ANDHRA PRADESH	KRISHNA
29	K. K. WAGH INSTITUTE OF ENGINEERING EDUCATION & RESEARCH	MAHARASHTRA	NASHIK
30	ARASU ENGINEERING COLLEGE	TAMIL NADU	THANJAVUR
31	BHABHA ENGINEERING RESEARCH INSTITUTE	MADHYA PRADESH	BHOPAL
32	HINDUSTHAN INSTITUTE OF TECHNOLOGY	TAMIL NADU	COIMBATORE
33	SRI SATYA SAI COLLEGE OF ENGINEERING	MADHYA PRADESH	BHOPAL
34	K RAMAKRISHNAN COLLEGE OF TECHNOLOGY	TAMIL NADU	TIRUCHIRAPPALLI
35	VIGNAN'S INSTITUTE OF ENGINEERING FOR WOME	ANDHRA PRADESH	VISHAKHAPATNAM
36	SRI SIDDHARTHA ACADEMY OF HIGHER EDUCATION AGALKOTE	KARNATAKA	TUMKUR
37	VIGNAN'S INSTITUTE OF MANAGEMENT AND TECHNOLOGY FOR WOMEN	TELANGANA	RANGAREDDI
38	MADHIRA INSTITUTE OF TECHNOLOGY & SCIENCES	TELANGANA	NALGONDA
39	AMAL JYOTHI COLLEGE OF ENGINEERING	KERALA	KOTTAYAM

40	MJR COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	CHITTOOR
41	NARAYANAGURU COLLEGE OF ENGINEERING	TAMIL NADU	KANYAKUMARI
42	BRILLIANT GRAMMAR SCHOOL EDUCATIONAL SOCIETY'S GROUP OF INSTITUTIONS	TELANGANA	RANGAREDDI
43	RAJASTHAN INSTITUTE OF ENGINEERING & TECHNOLOGY	RAJASTHAN	JAIPUR
44	MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY	DELHI	WEST DELHI
45	DISHA INSTITUTE OF MANAGEMENT AND TECHNOLOGY (BE)	CHHATTISGARH	RAIPUR
46	VIDHYAPEETH INSTITUTE OF SCIENCE & TECHNOLOGY	MADHYA PRADESH	BHOPAL
47	SNS COLLEGE OF TECHNOLOGY	TAMIL NADU	COIMBATORE
48	REVA UNIVERSITY	KARNATAKA	BANGALORE URBAN
49	SRI MITTAPALLI COLLEGE OF ENGINEERING	ANDHRA PRADESH	GUNTUR
50	SRI SHAKTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	COIMBATORE
51	GREATER NOIDA INSTITUTE OF TECHNOLOGY (ENGINEERING INSTITUTE)	UTTAR PRADESH	GAUTAM BUDDHA NAGAR
52	GMR INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	SRIKAKULAM
53	ANNA UNIVERSITY	TAMIL NADU	CHENNAI
54	SVR ENGINEERING COLLEGE	ANDHRA PRADESH	KURNOOL
55	SHRI G.S.INSTITUTE OF TECH. & SCIENCE	MADHYA PRADESH	INDORE
56	NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE	KERALA	THRISSUR
57	INSTITUTE OF TECHNOLOGY & MANAGEMENT	MADHYA PRADESH	GWALIOR
58	JEPPIAAR ENGINEERING COLLEGE (E&T)	TAMIL NADU	KANCHIPURAM
59	MODY UNIVERSITY OF SCIENCE AND TECHNOLOGY	RAJASTHAN	SIKAR
60	FACULTY OF TECHNOLOGY & ENGINEERING, THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA	GUJARAT	VADODARA
61	ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES	ANDHRA PRADESH	VISHAKHAPATNAM
62	USHA RAMA COLLEGE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	KRISHNA
63	VARAPRASAD REDDY INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	GUNTUR
64	AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN DEEMED TO BE UNIVERSITY	TAMIL NADU	COIMBATORE
65	S.R. M INSTITUTE OF SCIENCE AND TECHNOLOGY	TAMIL NADU	KANCHIPURAM
66	SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	CHITTOOR
67	AJEENKYA DY PATIL SCHOOL OF ENGINEERING	MAHARASHTRA	PUNE
68	SRI VENKATESWARA COLLEGE OF ENGINEERING	ANDHRA PRADESH	CHITTOOR
69	MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE	ANDHRA PRADESH	GUNTUR
70	UNIVERSITY COLLEGE OF SCIENCE & TECHNOLOGY,CALCUTTA UNIVERSITY)	WEST BENGAL	KOLKATA
71	MEGHNAD SAHA INSTITUTE OF TECHNOLOGY	WEST BENGAL	KOLKATA
72	JAMIA MILLIA ISLAMIA (A CENTRAL UNIVERSITY)	DELHI	SOUTH DELHI
73	JANSONS INSTITUTE OF TECHNOLOGY	TAMIL NADU	COIMBATORE
74	KATIHAR ENGINEERING COLLEGE, KATIHAR	BIHAR	KATIHAR
75	R.M.K. COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	THIRUVALLUR
76	VISVESVARAYA TECHNOLOGICAL UNIVERSITY	KARNATAKA	GULBARGA
77	SRM INSTITUTE OF SCIENCE AND TECHNOLOGY TIRUCHIRAPPALLI	TAMIL NADU	TIRUCHIRAPPALLI
78	SURYA GROUP OF INSTITUTIONS	TAMIL NADU	VILUPPURAM
79	NITTE MEENAKSHI INSTITUTE OF TECHNOLOGY	KARNATAKA	BANGALORE RURAL
80	TIRUMALA INSTITUTE OF TECHNOLOGY AND SCIENCES	ANDHRA PRADESH	GUNTUR
81	AKSHAYA COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	COIMBATORE
82	SRM TRP ENGINEERING COLLEGE	TAMIL NADU	TIRUCHIRAPPALLI
83	ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT	ANDHRA PRADESH	SRIKAKULAM
84	ADHIPARASAKTHI ENGINEERING COLLEGE	TAMIL NADU	KANCHIPURAM

85	KUMARAGURU COLLEGE OF TECHNOLOGY	TAMIL NADU	COIMBATORE
86	INFO INSTITUTE OF ENGINEERING	TAMIL NADU	COIMBATORE
87	PRIYADARSHINI INSTITUTE OF SCIENCE TECHNOLOGY FOR WOMEN	TELANGANA	KHAMMAM
88	ADUSUMILLI VIJAYA INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE	TELANGANA	NALGONDA
89	SREE DATTHA INSTITUTE OF ENGINEERING AND SCIENCE	TELANGANA	RANGAREDDI
90	DREAM INSTITUTE OF TECHNOLOGY	WEST BENGAL	SOUTH 24 PARGANAS
91	TECHNOCRATS INSTITUTE OF TECHNOLOGY	MADHYA PRADESH	BHOPAL
92	RAMACHANDRA COLLEGE OF ENGINEERING	ANDHRA PRADESH	WEST GODAVARI
93	JSPM NARHE TECHNICAL CAMPUS	MAHARASHTRA	PUNE
94	MINA INSTITUTE OF ENGINERING TECHNOLOGY FOR WOMEN	TELANGANA	NALGONDA
95	AVANTHI INSTITUTE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	VISHAKHAPATNAM
96	DEPARTMENT OF ELECTRONICS, COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY	KERALA	ERNAKULAM
97	SRM INSTITUTE OF SCIENCE AND TECHNOLOGY RAMAPURAM PART CAMPUS	TAMIL NADU	CHENNAI
98	SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	SRIKAKULAM
99	AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	NELLORE
100	GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING	ANDHRA PRADESH	VISHAKHAPATNAM
101	KINGS COLLEGE OF ENGINEERING	TAMIL NADU	PUDUKKOTTAI
102	COEP TECHNOLOGICAL UNIVERSITY	MAHARASHTRA	PUNE
103	AVANTHI INSTITUTE OF ENGINERRING AND TECHNOLOGY	ANDHRA PRADESH	VIZIANAGARAM
104	N.P.R COLLEGE OF ENGINEERING & TECHNOLOGY	TAMIL NADU	DINDIGUL
105	NANDHA ENGINEERING COLLEGE	TAMIL NADU	ERODE
106	R.M.K. ENGINEERING COLLEGE	TAMIL NADU	THIRUVALLUR
107	SRIDEVI WOMEN'S ENGINEERING COLLEGE	TELANGANA	RANGAREDDI
108	JSPM'S RAJARSHI SHAHU COLLEGE OF ENGINEERING	MAHARASHTRA	PUNE
109	BONAM VENKATACHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE	ANDHRA PRADESH	EAST GODAVARI
110	RISE KRISHNA SAI PRAKASAM GROUP OF INSTITUTIONS	ANDHRA PRADESH	PRAKASAM
111	NOVA COLLEGE OF ENGINEERING & TECHNOLOGY	TELANGANA	RANGAREDDI
112	K J COLLEGE OF ENGINEERING & MANAGEMENT RESEARCH	MAHARASHTRA	PUNE
113	HON.SHRI BABANRAO PACHPUTE VICHARDHARA TRUST'S GROUP OF INSTITUTIONS	MAHARASHTRA	AHMEDNAGAR
114	VELAGA NAGESWARA RAO COLLEGE OF ENGINEERING PONNUR	ANDHRA PRADESH	GUNTUR
115	JNTUH UNIVERSITY COLLEGE OF ENGINEERING SULTANPUR	TELANGANA	MEDAK
116	NRI INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	GUNTUR
117	G.PULLA REDDY ENGINEERING COLLEGE	ANDHRA PRADESH	KURNOOL
118	SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES	ANDHRA PRADESH	CHITTOOR
119	B.G.S INSTITUTE OF TECHNOLOGY	KARNATAKA	MANDYA
120	CHIRALA ENGINEERING COLLEGE	ANDHRA PRADESH	PRAKASAM
121	SRI CHAITANYA - DJR INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	KRISHNA
122	SIDDHANT COLLEGE OF ENGINEERING	MAHARASHTRA	PUNE
123	V.S.M. COLLEGE OF ENGINEERING	ANDHRA PRADESH	EAST GODAVARI
124	MIRACLE EDUCATIONAL SOCIETY GROUP OF INSTITUTIONS	ANDHRA PRADESH	VIZIANAGARAM
125	SRINIVASA INSTITUTE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	EAST GODAVARI
126	A1 GLOBAL INSTITUTE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	PRAKASAM

127	GIET UNIVERSITY	ODISHA	RAYAGADA
128	SREE VAHINI INSTITUTE OF SCIENCE AND TECHNOLOGY	ANDHRA PRADESH	KRISHNA
129	SIR C.V.RAMAN INSTITUTE OF TECHNOLOGY & SCIENCES	ANDHRA PRADESH	ANANTAPUR
130	V.R.S & Y.R.N COLLEGE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	PRAKASAM
131	ADI SHANKARA INSTITUTE OF ENGINEERING AND TECHNOLOGY	KERALA	ERNAKULAM
132	GOVERNMENT ENGINEERING COLLEGE IDUKKI	KERALA	IDUKKI
133	NALLA MALLA REDDY ENGINEERING COLLEGE	TELANGANA	RANGAREDDI
134	COLLEGE OF ENGINEERING MUNNAR	KERALA	IDUKKI
135	HELAPURI INSTITUTE OF TECHNOLOGY & SCIENCE	ANDHRA PRADESH	WEST GODAVARI
136	SAVEETHA ENGINEERING COLLEGE	TAMIL NADU	KANCHIPURAM
137	COLLEGE OF ENGINEERING, THALASSERY	KERALA	KANNUR
138	SIDDHARTHA INSTITUTE OF ENGINEERING & TECHNOLOGY	TELANGANA	RANGAREDDI
139	SRI SAI INSTITUTE OF TECHNOLOGY AND SCIENCE	ANDHRA PRADESH	YSR DISTRICT
140	GURU NANAK INSTITUTIONS TECHNICAL CAMPUS	TELANGANA	RANGAREDDI
141	CVR COLLEGE OF ENGINEERING	TELANGANA	RANGAREDDI
142	TECHNO MAIN SALT LAKE	WEST BENGAL	KOLKATA
143	CHENNAI INSTITUTE OF TECHNOLOGY	TAMIL NADU	KANCHIPURAM
144	MALLA REDDY ENGINEERING COLLEGE	TELANGANA	RANGAREDDI
145	MANIPAL ACADEMY OF HIGHER EDUCATION	KARNATAKA	UDUPI
146	DELHI TECHNOLOGICAL UNIVERSITY	DELHI	NORTH WEST DELHI
147	MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY WEST BENGAL	WEST BENGAL	NORTH 24 PARGANAS
148	SHARNBASVA UNIVERSITY	KARNATAKA	GULBARGA
149	NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY	UTTAR PRADESH	GAUTAM BUDDHA NAGAR
150	SRI VENKATESWARAA COLLEGE OF TECHNOLOGY	TAMIL NADU	KANCHIPURAM
151	DR. AMBEDKAR INSTITUTE OF TECHNOLOGY	KARNATAKA	BANGALORE URBAN
152	TALLA PADMAVATHI COLLEGE OF ENGINEERING	TELANGANA	WARANGAL
153	MUTHAYAMMAL ENGINEERING COLLEGE	TAMIL NADU	NAMAKKAL
154	VEMU INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	CHITTOOR
155	SRI AUROBINDO INSTITUTE OF TECHNOLOGY, INDORE	MADHYA PRADESH	INDORE
156	SASI INSTITUTE OF TECHNOLOGY & ENGINEERING	ANDHRA PRADESH	WEST GODAVARI
157	DR. SIVANTHI ADITANAR COLLEGE OF ENGINEERING	TAMIL NADU	THOOTHUKUDI
158	VIJAYA ENGINEERING COLLEGE	TELANGANA	KHAMMAM
159	AMRITA VISHWA VIDYAPEETHAM AMRITAPURI CAMPUS	KERALA	KOLLAM
160	PRATHYUSHA ENGINEERING COLLEGE	TAMIL NADU	THIRUVALLUR
161	NRI INSTITUTE OF INFORMATION SCIENCE AND TECHNOLOGY	MADHYA PRADESH	BHOPAL
162	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	EAST GODAVARI
163	MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE	ANDHRA PRADESH	CHITTOOR
164	PUNJAB ENGINEERING COLLEGE DEEMED TO BE UNIVERSITY	CHANDIGARH	CHANDIGARH
165	KKR & KSR INSTITUTE OF TECHNOLOGY AND SCIENCES	ANDHRA PRADESH	GUNTUR
166	NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH	TAMIL NADU	CHENNAI
167	PSG COLLEGE OF TECHNOLOGY	TAMIL NADU	COIMBATORE
168	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN	TAMIL NADU	NAMAKKAL
169	FEDERAL INSTITUTE OF SCIENCE AND TECHNOLOGY (FISAT)	KERALA	ERNAKULAM
170	GLOBAL COLLEGE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	YSR DISTRICT
171	AVN INSTITUTE OF ENGINEERING & TECHNOLOGY	TELANGANA	RANGAREDDI

172	VEL TECH MULTI TECH DR.RANGARAJAN DR.SAKUNTHALA ENGINEERING COLLEGE	TAMIL NADU	THIRUVALLUR
173	MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY	TELANGANA	RANGAREDDI
174	SREEPATHY INSTITUTE OF MANAGEMENT AND TECHNOLOGY	KERALA	PALAKKAD
175	MANIPAL UNIVERSITY JAIPUR	RAJASTHAN	JAIPUR
176	HI-TECH INSTITUTE OF TECHNOLOGY	ODISHA	KHORDHA
177	UNIVERSITY OF HYDERABAD	TELANGANA	RANGAREDDI
178	S.R.K.INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	KRISHNA
179	ADITYA ENGINEERING COLLEGE	ANDHRA PRADESH	EAST GODAVARI
180	VAAGDEVI ENGINEERING COLLEGE	TELANGANA	WARANGAL
181	UNIVERSITY TEACHING DEPARTMENT CSVTU BHILAI	CHHATTISGARH	DURG
182	THE CHANAKYA UNIVERSITY	KARNATAKA	BANGALORE RURAL
183	DR.MAHALINGAM COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	COIMBATORE
184	KALINGA INSTITUE OF INDUSTRIAL TECHNOLOGY	ODISHA	KHORDHA
185	MANAV RACHNA UNIVERSITY	HARYANA	FARIDABAD
186	SHRI GURU GOBIND SINGHJI INSTITUTE OF ENGINEERING AND TECHNOLOGY	MAHARASHTRA	NANDED
187	CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING, NOIDA	UTTAR PRADESH	GAUTAM BUDDHA NAGAR
188	TAGORE INSTITUTE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	SALEM
189	SRM MADURAI COLLEGE FOR ENGINEERING & TECHNOLOGY	TAMIL NADU	SIVAGANGA
190	M.P.NACHIMUTHU M.JAGANATHAN ENGINEERING COLLEGE	TAMIL NADU	ERODE
191	SREE SAKTHI ENGINEERING COLLEGE	TAMIL NADU	COIMBATORE
192	UNIVERSITY INSTITUTE OF SCIENCE AND TECHNOLOGY, RABINDRANATH TAGORE UNIVERSITY	MADHYA PRADESH	RAISEN
193	THIRUMALAI ENGINEERING COLLEGE	TAMIL NADU	KANCHIPURAM
194	SARDAR RAJA COLLEGE OF ENGINEERING	TAMIL NADU	TIRUNELVELI
195	NATIONAL INSTITUTE OF ELECTRONICS AND INFORMATION TECHNOLOGY, GORAKHPUR CENTRE	UTTAR PRADESH	GORAKHPUR
196	M. S. RAMAIAH UNIVERSITY OF APPLIED SCIENCES	KARNATAKA	BANGALORE URBAN
197	ANNA UNIVERSITY REGIONAL CAMPUS COIMBATORE	TAMIL NADU	COIMBATORE
198	SERSHAH ENGINEERING COLLEGE, SASARAM	BIHAR	ROHTAS
199	VISVESVARAYA TECHNOLOGICAL UNIVERSITY DEPARTMENT OF PG STUDIES	KARNATAKA	BELGAUM
200	T.J.S.ENGINEERING COLLEGE	TAMIL NADU	THIRUVALLUR
201	R.K. COLLEGE OF ENGINEERING	ANDHRA PRADESH	KRISHNA
202	MOTHER TERASA COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	PUDUKKOTTAI
203	I.T.S ENGINEERING COLLEGE	UTTAR PRADESH	GAUTHAM BUDDHA NAGAR
204	CHALAPATHI INSTITUTE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	GUNTUR
205	SHREE SATHYAM COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	SALEM
206	ALARD COLLEGE OF ENGINEERING & MANAGEMENT	MAHARASHTRA	PUNE
207	GOVERNMENT ENGINEERING COLLEGE SIWAN	BIHAR	SIWAN
208	GOVERNMENT ENGINEERING COLLEGE WEST CHAMPARAN	BIHAR	WEST CHAMPARAN
209	KALLAM HARANADHAREDDY INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	GUNTUR
210	BANASTHALI VIDYAPITH DEEMED TO BE UNIVERSITY	RAJASTHAN	TONK
211	UNIVERSITY COLLEGE OF ENGINEERING, BITCAMPUS TIRUCHIRAPPALLI	TAMIL NADU	TIRUCHIRAPPALLI
212	MAHA BARATHI ENGINEERING COLLEGE	TAMIL NADU	VILUPPURAM
213	MEGHA INSTITUTE OF ENGINEERING AND TECHNOLOGY FOR WOMEN	TELANGANA	RANGAREDDI

214	JNN INSTITUTE OF ENGINEERING	TAMIL NADU	THIRUVALLUR
215	SYED AMMAL ENGINEERING COLLEGE	TAMIL NADU	RAMANATHAPURAM
216	BAPURAO DESHMUKH COLLEGE OF ENGINEERING, SEWAGRAM	MAHARASHTRA	WARDHA
217	AVS ENGINEERING COLLEGE	TAMIL NADU	SALEM
218	KLE TECHNOLOGICAL UNIVERSITY	KARNATAKA	DHARWAD
219	METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY	TELANGANA	HYDERABAD
220	M S ENGINEERING COLLEGE	KARNATAKA	BANGALORE RURAL
221	GONNA INSTITUTE OF INFORMATION TECHNOLOGY AND SCIENCES	ANDHRA PRADESH	VISHAKHAPATNAM
222	BUDDHA INSTITUTE OF TECHNOLOGY	UTTAR PRADESH	GORAKHPUR
223	CHRIST DEEMED TO BE UNIVERSITY KENGERI CAMPUS	KARNATAKA	BANGALORE URBAN
224	PSN ENGINEERING COLLEGE	TAMIL NADU	TIRUNELVELI
225	JAYA ENGINEERING COLLEGE	TAMIL NADU	THIRUVALLUR
226	J C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY	HARYANA	FARIDABAD
227	MAM WOMEN'S ENGINEERING COLLEGE	ANDHRA PRADESH	GUNTUR
228	SRI ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCE	ANDHRA PRADESH	YSR DISTRICT
229	PRAVARA RURAL ENGINEERING COLLEGE	MAHARASHTRA	AHMEDNAGAR
230	NOVA'S INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	WEST GODAVARI
231	SIDDHARTHA INSTITUTE OF TECHNOLOGY AND SCIENCES	TELANGANA	RANGAREDDI
232	GALGOTIAS COLLEGE OF ENGINEERING & TECHNOLOGY	UTTAR PRADESH	GAUTAM BUDDHA NAGAR
233	RAJALAKSHMI INSTITUTE OF TECHNOLOGY	TAMIL NADU	THIRUVALLUR
234	ANDHRA LOYOLA INSTITUTE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	KRISHNA
235	MODEL ENGINEERING COLLEGE	KERALA	ERNAKULAM
236	VANDAYAR ENGINEERING COLLEGE	TAMIL NADU	THANJAVUR
237	TEEGALA KRISHNA REDDY ENGINEERING COLLEGE	TELANGANA	RANGAREDDI
238	CAMBRIDGE INSTITUTE OF TECHNOLOGY	KARNATAKA	BANGALORE URBAN
239	DADI INSTITUTE OF ENGINEERING & TECHNOLOGY (DIET)	ANDHRA PRADESH	VISHAKHAPATNAM
240	VELAGAPUDI RAMAKRISHNA SIDDHARTHA ENGINEERING COLLEGE	ANDHRA PRADESH	KRISHNA
241	LAKSHMI NARAIN COLLEGE OF TECHNOLOGY	MADHYA PRADESH	BHOPAL
242	DR. VITHALRAO VIKHE PATIL COLLEGE OF ENGINEERING AHMEDNAGAR	MAHARASHTRA	AHMEDNAGAR
243	BNM INSTITUTE OF TECHNOLOGY	KARNATAKA	BANGALORE URBAN
244	PADMABHOOSHAN VASANTDADA PATIL INSTITUTE OF TECHNOLOGY, PUNE	MAHARASHTRA	PUNE
245	NOVA COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	WEST GODAVARI
246	K.G.REDDY COLLEGE OF ENGINEERING & TECHNOLOGY	TELANGANA	RANGAREDDI
247	DRONACHARYA GROUP OF INSTITUTIONS	UTTAR PRADESH	GAUTAM BUDDHA NAGAR
248	GURU NANAK INSTITUTE OF TECHNOLOGY	MAHARASHTRA	NAGPUR
249	ADINA INSTITUTE OF SCIENCE AND TECHNOLOGY, SAGAR, MP	MADHYA PRADESH	SAGAR
250	G H RAISONI COLLEGE OF ENGINEERING & MANAGEMENT, NAGPUR	MAHARASHTRA	NAGPUR
251	B.M.S.COLLEGE OF ENGINEERING	KARNATAKA	BANGALORE URBAN
252	KNOWLEDGE INSTITUTE OF TECHNOLOGY	TAMIL NADU	SALEM
253	KUPPAM ENGINEERING COLLEGE	ANDHRA PRADESH	CHITTOOR
254	PRAKASAM ENGINEERING COLLEGE	ANDHRA PRADESH	PRAKASAM
255	NARASARAOPETA ENGINEERING COLLEGE	ANDHRA PRADESH	GUNTUR
256	SAGAR INSTITUTE OF RESEARCH & TECHNOLOGY	MADHYA PRADESH	BHOPAL
257	SCHOOL OF ENGINEERING	ASSAM	KAMRUP METROPOLITAN
258	ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S COLLEGE OF ENGINEERING, PUNE-1	MAHARASHTRA	PUNE

259	GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN	ANDHRA PRADESH	VISHAKHAPATNAM
260	SCHOOL OF ENGINEERING SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES,(SSSUTMS)	MADHYA PRADESH	SEHORE
261	KPR INSTITUTE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	COIMBATORE
262	INFINITY MANAGEMENT & ENGINEERING COLLEGE	MADHYA PRADESH	SAGAR
263	DR. C. V. RAMAN UNIVERSITY	CHHATTISGARH	BILASPUR
264	SHRI RAM INSTITUTE OF TECHNOLOGY	MADHYA PRADESH	JABALPUR
265	SRI VENKATESWARA INSTITUTE OF SCIENCE & TECHNOLOGY	TAMIL NADU	THIRUVALLUR
266	M.I.E.T. ENGINEERING COLLEGE	TAMIL NADU	TIRUCHIRAPPALLI
267	BANKURA UNNAYANI INSTITUTE OF ENGINEERING	WEST BENGAL	BANKURA
268	SHRI VISHNU ENGINEERING COLLEGE FOR WOMEN	ANDHRA PRADESH	WEST GODAVARI
269	VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY	ANDHRA PRADESH	VISHAKHAPATNAM
270	PYDAH COLLEGE OF ENGINEERING	ANDHRA PRADESH	EAST GODAVARI
271	QUBA COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	NELLORE
272	DAYANANDA SAGAR COLLEGE OF ENGINEERING	KARNATAKA	BANGALORE URBAN
273	ANGEL COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	TIRUPPUR
274	NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	VISHAKHAPATNAM
275	JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES	TELANGANA	WARANGAL
276	JNTUA COLLEGE OF ENGINEERING	ANDHRA PRADESH	ANANTAPUR
277	D.Y.PATIL COLLEGE OF ENGINEERING	MAHARASHTRA	PUNE
278	TRIPURA INSTITUTE OF TECHNOLOGY	TRIPURA	WEST TRIPURA
279	AMRITA SAI INSTITUTE OF SCIENCE AND TECHNOLOGY	ANDHRA PRADESH	KRISHNA
280	SHAH AND ANCHOR KUTCHHI ENGINEERING COLLEGE	MAHARASHTRA	MUMBAI CITY
281	SBM COLLEGE OF ENGINEERING & TECHNOLOGY	TAMIL NADU	DINDIGUL
282	SREE VENKATESWARA COLLEGE OF ENGINEERING	ANDHRA PRADESH	NELLORE
283	AVANTHI INSTITUTE OF ENGINEERING & TECHNOLOGY	TELANGANA	RANGAREDDI
284	P.E.S. COLLEGE OF ENGINEERING, MANDYA	KARNATAKA	MANDYA
285	AMRITA VISHWA VIDYAPEETHAM CHENNAI CAMPUS	TAMIL NADU	THIRUVALLUR
286	L. D. COLLEGE OF ENGINEERING	GUJARAT	AHMEDABAD
287	VIGNANS FOUNDATION FOR SCIENCE TECHNOLOGY AND RESEARCH	ANDHRA PRADESH	GUNTUR
288	ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES	ANDHRA PRADESH	YSR DISTRICT
289	PRESIDENCY UNIVERSITY	KARNATAKA	BANGALORE URBAN
290	ST. JOHNS COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	KURNOOL
291	YENEPOYA INSTITUTE OF TECHNOLOGY	KARNATAKA	DAKSHINA KANNADA
292	S. E. A. COLLEGE OF ENGINEERING & TECHNOLOGY	KARNATAKA	BANGALORE URBAN
293	M.A.M. COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	TIRUCHIRAPPALLI
294	MANDAVA INSTITUTE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	KRISHNA
295	MADAN MOHAN MALAVIYA UNIVERSITY OF TECHNOLOGY	UTTAR PRADESH	GORAKHPUR
296	VISWAJYOTHI COLLEGE OF ENGINEERING & TECHNOLOGY	KERALA	ERNAKULAM
297	BHARATI VIDYAPEETH 'S COLLEGE OF ENGINEERING FOR WOMEN	MAHARASHTRA	PUNE
298	SAI RAJESWARI INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	YSR DISTRICT
299	SHRIRAM COLLEGE OF ENGINEERING & MANAGEMENT, BANMORE	MADHYA PRADESH	MORENA
300	SRI VENKATESWARA ENGINEERING COLLEGE	TELANGANA	NALGONDA
301	M.KUMARASAMY COLLEGE OF ENGINEERING	TAMIL NADU	KARUR
302	VASIREDDY VENKATADRI INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	GUNTUR
303	NETAJI SUBHASH ENGINEERING COLLEGE	WEST BENGAL	KOLKATA
304	TECHNO INTERNATIONAL NEW TOWN	WEST BENGAL	KOLKATA
305	MAHAVEER INSTITUTE OF SCIENCE & TECHNOLOGY	TELANGANA	HYDERABAD
306	DRK INSTITUTE OF SCIENCE AND TECHNOLOGY	TELANGANA	RANGAREDDI

307	VEER MADHO SINGH BHANDARI UTTARAKHAND TECHNICAL UNIVERSITY	UTTARAKHAND	DEHRADUN
308	MGM TECHNOLOGICAL CAMPUS	KERALA	MALAPPURAM
309	ROEVER ENGINEERING COLLEGE	TAMIL NADU	PERAMBALUR
310	GURUGRAM UNIVERSITY	HARYANA	GURGAON
311	GOVERNMENT ENGINEERING COLLEGE GOPALGANJ	BIHAR	GOPALGANJ
312	KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES	TAMIL NADU	COIMBATORE
313	NMAM INSTITUTE OF TECHNOLOGY, NITTE	KARNATAKA	UDUPI
314	NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING & RESEARCH	CHANDIGARH	CHANDIGARH
315	KONERU LAKSHMAIAH EDUCATION FOUNDATION	ANDHRA PRADESH	GUNTUR
316	HINDUSTAN COLLEGE OF SCIENCE & TECHNOLOGY	UTTAR PRADESH	MATHURA
317	JSS ACADEMY OF TECHNICAL EDUCATION	KARNATAKA	BANGALORE URBAN
318	KANDULA OBULA REDDY MEMORIAL COLLEGE OF ENGINEERING	ANDHRA PRADESH	YSR DISTRICT
319	G.H.RAISONI COLLEGE OF ENGINEERING & MANAGEMENT	MAHARASHTRA	PUNE
320	ANURAG ENGINEERING COLLEGE	TELANGANA	NALGONDA
321	AVANTHI S ST.THERESSA INSTITUTE OF ENGINEERING AND TECHNOLOGY,GARIVIDI	ANDHRA PRADESH	VIZIANAGARAM
322	ANDHRA UNIVERSITY COLLEGE OF ENGINEERING	ANDHRA PRADESH	VISHAKHAPATNAM
323	GIRIJANANDA CHOWDHURY UNIVERSITY, ASSAM	ASSAM	KAMRUP METROPOLITAN
324	KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION	TAMIL NADU	VIRUDHUNAGAR
325	PSNA COLLEGE OF ENGINEERING AND TECHNOLOGY , DINDIGUL	TAMIL NADU	DINDIGUL
326	BHAGALPUR COLLEGE OF ENGINEERING , BHAGALPUR	BIHAR	BHAGALPUR
327	JAIN DEEMED TO BE UNIVERSITY FACULTY OF ENGINEERING AND TECHNOLOGY	KARNATAKA	RAMANAGARA
328	DR.K.V.SUBBA REDDY INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	KURNOOL
329	B S A CRESCENT INSTITUTE OF SCIENCE AND TECHNOLOGY	TAMIL NADU	KANCHIPURAM
330	PALADUGU PARVATHI DEVI COLLEGE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	KRISHNA
331	UNIVERSITY COLLEGE OF ENGINEERING	TELANGANA	HYDERABAD
332	PACE INSTITUTE OF TECHNOLOGY AND SCIENCES	ANDHRA PRADESH	PRAKASAM
333	SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY	KARNATAKA	TUMKUR
334	K.S.RANGASAMY COLLEGE OF TECHNOLOGY	TAMIL NADU	NAMAKKAL
335	AWH ENGINEERING COLLEGE	KERALA	KOZHIKODE
336	LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING	ANDHRA PRADESH	KRISHNA
337	PGP COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	NAMAKKAL
338	BHIMAVARAM INSTITUTE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	WEST GODAVARI
339	GOLDEN VALLEY INTEGRATED CAMPUS	ANDHRA PRADESH	CHITTOOR
340	CMR INSTITUTE OF TECHNOLOGY	TELANGANA	RANGAREDDI
341	JADAVPUR UNIVERSITY	WEST BENGAL	KOLKATA
342	SANA ENGINEERING COLLEGE	TELANGANA	NALGONDA
343	SRI VENKATESWARA INSTITUTE OF TECHNOLOGY.	ANDHRA PRADESH	ANANTAPUR
344	SRI VASAVI INSTITUTE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	KRISHNA
345	THE OXFORD COLLEGE OF ENGINEERING	KARNATAKA	BANGALORE URBAN
346	G.V.R & S COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	GUNTUR
347	NARAYANA ENGINEERING COLLEGE	ANDHRA PRADESH	NELLORE
348	SREE NARAYANA GURUKULAM COLLEGE OF ENGINEERING	KERALA	ERNAKULAM
349	PATEL COLLEGE OF SCIENCE & TECHNOLOGY	MADHYA PRADESH	INDORE
350	SISTER NIVEDITA UNIVERSITY	WEST BENGAL	NORTH 24 PARGANAS
351	DR.M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE	TAMIL NADU	THIRUVALLUR

352	GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT GITAM VISAKHAPATNAM	ANDHRA PRADESH	VISAKHAPATNAM
353	ACHARYA COLLEGE OF ENGINEERING	ANDHRA PRADESH	YSR DISTRICT
354	VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY	TELANGANA	RANGAREDDI
355	KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE	TELANGANA	WARANGAL
356	ISBM COLLEGE OF ENGINEERING PUNE	MAHARASHTRA	PUNE
357	QIS COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	PRAKASAM
358	ACROPOLIS INSTITUTE OF TECHNOLOGY AND RESEARCH	MADHYA PRADESH	INDORE
359	SAMARTH COLLEGE OF ENGINEERING AND MANAGEMENT	MAHARASHTRA	PUNE
360	JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY	UTTAR PRADESH	GAUTAM BUDDHA NAGAR
361	SHRI RAMDEOBABA COLLEGE OF ENGINEERING AND MANAGEMENT	MAHARASHTRA	NAGPUR
362	ANAND INSTITUTE OF HIGHER TECHNOLOGY	TAMIL NADU	KANCHIPURAM
363	SAINTGITS COLLEGE OF ENGINEERING	KERALA	KOTTAYAM
364	SRI RAMAKRISHNA ENGINEERING COLLEGE	TAMIL NADU	COIMBATORE
365	DEENBANDHU CHHOTU RAM UNIVERSITY OF SCI AND TECH	HARYANA	SONEPAT
366	PARVATHAREDDY BABULREDDY VISVODAYA INSTITUTE OF TECHNOLOGY AND SCIENCE	ANDHRA PRADESH	NELLORE
367	VAAGESWARI COLLEGE OF ENGINEERING	TELANGANA	KARIMNAGAR
368	CHADALAWADA RAMANAMMA ENGINEERING COLLEGE	ANDHRA PRADESH	CHITTOOR
369	SRI SIVASUBRMANIYA NADAR COLLEGE OF ENGINEERING	TAMIL NADU	KANCHIPURAM
370	SENGUNTHAR ENGINEERING COLLEGE	TAMIL NADU	NAMAKKAL
371	VAAGDEVI COLLEGE OF ENGINEERING	TELANGANA	WARANGAL
372	BIRLA INSTIUTTE OF TECHNOLOGY AND SCIENCE PILANI HYDERABAD CAMPUS	TELANGANA	RANGAREDDI
373	SCOPE GLOBAL SKILLS UNIVERSITY	MADHYA PRADESH	BHOPAL
374	SWAMI VIVEKANAND COLLEGE OF ENGINEERING	MADHYA PRADESH	INDORE
375	UNIVERSITY COLLEGE OF ENGINEERING KAKINADA	ANDHRA PRADESH	EAST GODAVARI
376	SASTRA DEEMED UNIVERSITY	TAMIL NADU	THANJAVUR
377	MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	KANYAKUMARI
378	KIT-KALAIGNARKARUNANIDHI INSTITUTE OF TECHNOLOGY	TAMIL NADU	COIMBATORE
379	BM COLLEGE OF TECHNOLOGY	MADHYA PRADESH	INDORE
380	SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY	TAMIL NADU	VIRUDHUNAGAR
381	NSUT EAST CAMPUS	DELHI	EAST DELHI
382	ELECTRONIC SCIENCE DEPARTMENT	HARYANA	KURUKSHETRA
383	SRI RAMANUJAR ENGINEERING COLLEGE	TAMIL NADU	KANCHIPURAM
384	SUPAUL COLLEGE OF ENGINEERING, SUPAUL	BIHAR	SUPAUL
385	GOVERNMENT COLLEGE OF TECHNOLOGY	TAMIL NADU	COIMBATORE
386	LINGARAJAPPA ENGINEERING COLLEGE	KARNATAKA	BIDAR
387	INDRA GANESAN COLLEGE OF ENGINEERING	TAMIL NADU	TIRUCHIRAPPALLI
388	OXFORD ENGINEERING COLLEGE	TAMIL NADU	TIRUCHIRAPPALLI
389	GDMM COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	KRISHNA
390	S.A.ENGINEERING COLLEGE	TAMIL NADU	THIRUVALLUR
391	SHRI SHANKARACHARYA TECHNICAL CAMPUS	CHHATTISGARH	DURG
392	MAHENDRA INSTITUTE OF TECHNOLOGY	TAMIL NADU	NAMAKKAL
393	VASAVI COLLEGE OF ENGINEERING	TELANGANA	HYDERABAD
394	NIMRA COLLEGE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	KRISHNA
395	PRAGATI ENGINEERING COLLEGE	ANDHRA PRADESH	EAST GODAVARI
396	NALLA NARASIMHA REDDY EDUCATION SOCIETY'S GROUP OF INSTITUTIONS	TELANGANA	RANGAREDDI
397	V.S.B. COLLEGE OF ENGINEERING TECHNICAL CAMPUS	TAMIL NADU	COIMBATORE
398	R P SARATHY INSTITUTE OF TECHNOLOGY	TAMIL NADU	SALEM

399	GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT GITAM OFF CAMPUS BENGALURU	KARNATAKA	BANGALORE RURAL
400	DVR&DR.HS MIC COLLEGE OF TECHNOLOGY	ANDHRA PRADESH	KRISHNA
401	MAHATMA GANDHI MISSION'S ,JAWAHARLAL NEHRU ENGINEERING COLLEGE	MAHARASHTRA	AURANGABAD
402	KONGU ENGINEERING COLLEGE	TAMIL NADU	ERODE
403	MOHAMED SATHAK ENGINEERING COLLEGE	TAMIL NADU	RAMANATHAPURAM
404	TRIDENT ACADEMY OF TECHNOLOGY	ODISHA	KHORDHA
405	SHAMBHUNATH INSTITUTE OF ENGINEERING & TECHNOLOGY	UTTAR PRADESH	ALLAHABAD
406	ITM UNIVERSITY - GWALIOR (SCHOOL OF ENGINEERING & TECHNOLOGY)	MADHYA PRADESH	GWALIOR
407	SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE	PUDUCHERRY	PUDUCHERRY
408	MANIPAL INSTITUTE OF TECHNOLOGY	KARNATAKA	UDUPI
409	NEWTON'S INSTITUTE OF ENGINEERING	ANDHRA PRADESH	GUNTUR
410	SANT LONGOWAL INSTITUTE OF ENGINEERING AND TECHNOLOGY SLIET DEEMED TO BE UNIVERSITY	PUNJAB	SANGRUR
411	BANGALORE INSTITUTE OF TECHNOLOGY	KARNATAKA	BANGALORE URBAN
412	CMR ENGINEERING COLLEGE	TELANGANA	RANGAREDDI
413	BENAIAH INSTITUTE OF TECHNOLOGY & SCIENCES	ANDHRA PRADESH	EAST GODAVARI
414	INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY	KERALA	THIRUVANANTHAPURAM
415	RV INSTITUTE OF TECHNOLOGY	ANDHRA PRADESH	GUNTUR
416	BVRIT HYDERABAD COLLEGE OF ENGINEERING FOR WOMEN	TELANGANA	HYDERABAD
417	SRI KRISHNA INSTITUTE OF TECHNOLOGY	KARNATAKA	BANGALORE URBAN
418	B.K. BIRLA INSTITUTE OF ENGINEERING AND TECHNOLOGY	RAJASTHAN	JHUNJHUNU
419	RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	KURNOOL
420	MUSALIAR COLLEGE OF ENGINEERING AND TECHNOLOGY PATHANAMTHITTA	KERALA	PATHANAMTHITTA
421	ER&DCI INSTITUTE OF TECHNOLOGY	KERALA	THIRUVANANTHAPURAM
422	KRISHNA CHAITANYA INSTITUTE OF TECHNOLOGY & SCIENCES	ANDHRA PRADESH	PRAKASAM
423	SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY	SIKKIM	EAST SIKKIM
424	SESHADRI RAO GUDLAVALLERU ENGINEERING COLLEGE	ANDHRA PRADESH	KRISHNA
425	MARATHWADA MITRA MANDAL'S COLLEGE OF ENGINEERING	MAHARASHTRA	PUNE
426	JAIHIND COLLEGE OF ENGINEERING	MAHARASHTRA	PUNE
427	GATE INSTITUTE OF TECHNOLOGY AND SCIENCES	TELANGANA	NALGONDA
428	RCC INSTITUTE OF INFORMATION TECHNOLOGY	WEST BENGAL	KOLKATA
429	MVJ COLLEGE OF ENGINEERING	KARNATAKA	BANGALORE URBAN
430	S.K.P. ENGINEERING COLLEGE	TAMIL NADU	TIRUVANNAMALAI
431	D. Y. PATIL UNIVERSITY SCHOOL OF ENGINEERING & TECHNOLOGY	MAHARASHTRA	PUNE
432	ANANTRAO PAWAR COLLEGE OF ENGINEERING & RESEARCH	MAHARASHTRA	PUNE
433	P.E.S. COLLEGE OF ENGINEERING	MAHARASHTRA	AURANGABAD
434	ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S INSTITUTE OF INFORMATION TECHNOLOGY	MAHARASHTRA	PUNE
435	MATOSHRI COLLEGE OF ENGINEERING & RESEARCH CENTRE, NASHIK	MAHARASHTRA	NASHIK
436	PRESTIGE INSTITUTE OF MANAGEMENT AND RESEARCH, BHOPAL	MADHYA PRADESH	BHOPAL
437	SHARADCHANDRA PAWAR COLLEGE OF ENGINEERING	MAHARASHTRA	PUNE
438	LNCT (BHOPAL) INDORE CAMPUS	MADHYA PRADESH	INDORE
439	ENGINEERING COLLEGE,AJMER	RAJASTHAN	AJMER
440	NETAJI SUBHAS UNIVERSITY OF TECHNOLOGY	DELHI	SOUTH WEST DELHI

441	SAGAR INSTITUTE OF SCIENCE & TECHNOLOGY (SISTEC)	MADHYA PRADESH	BHOPAL
442	VISHWAKARMA GOVERNMENT ENGINEERING COLLEGE, CHANDKHEDA	GUJARAT	AHMEDABAD
443	CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING	PUNJAB	S.A.S NAGAR
444	ARUL THARUM VPMM COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	VIRUDHUNAGAR
445	RAJEEV INSTITUTE OF TECHNOLOGY	KARNATAKA	HASSAN
446	GAUHATI UNIVERSITY INSTITUTE OF SCIENCE AND TECHNOLOGY	ASSAM	KAMRUP
447	SHADAN WOMEN'S COLLEGE OF ENGINEERING & TECHNOLOGY	TELANGANA	HYDERABAD
448	LENORA COLLEGE OF ENGINEERING	ANDHRA PRADESH	EAST GODAVARI
449	SRI SIVANI COLLEGE OF ENGINEERING	ANDHRA PRADESH	SRIKAKULAM
450	VISAKHA INSTITUTE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	VISHAKHAPATNAM
451	PRINCETON INSTITUTE OF ENGINEERING & TECHNOLOGY FOR WOMEN	TELANGANA	RANGAREDDI
452	SRI VASAVI ENGINEERING COLLEGE	ANDHRA PRADESH	WEST GODAVARI
453	NOVA COLLEGE OF ENGINEERING AND TECHNOLOGY	ANDHRA PRADESH	KRISHNA
454	MANGALAM COLLEGE OF ENGINEERING	KERALA	KOTTAYAM
455	JHULELAL INSTITUTE OF TECHNOLOGY	MAHARASHTRA	NAGPUR
456	SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES	TAMIL NADU	KANCHIPURAM
457	VINAYAKA MISSION'S KIRUPANANDA VARIYAR ENGINEERING COLLEGE	TAMIL NADU	SALEM
458	R.V.R.& J.C.COLLEGE OF ENGINEERING	ANDHRA PRADESH	GUNTUR
459	BHABHA COLLEGE OF ENGINEERING, BHOPAL	MADHYA PRADESH	BHOPAL
460	SANKETIKA VIDYA PARISHAD ENGINEERING COLLEGE	ANDHRA PRADESH	VISHAKHAPATNAM
461	M. S. RAMAIAH INSTITUTE OF TECHNOLOGY	KARNATAKA	BANGALORE URBAN
462	PIMPRI CHINCHWAD COLLEGE OF ENGINEERING	MAHARASHTRA	PUNE
463	ST. JOSEPH'S COLLEGE OF ENGINEERING & TECHNOLOGY, PALAI	KERALA	KOTTAYAM
464	MAR ATHANASIUS COLLEGE OF ENGINEERING, KOTHAMANGALAM	KERALA	ERNAKULAM
465	ELURU COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	WEST GODAVARI
466	IES COLLEGE OF ENGINEERING	KERALA	THRISSUR
467	GOVERNMENTENGINEERINGCOLLEGETHRISSUR	KERALA	THRISSUR
468	BABA INSTITUTE OF TECHNOLOGY AND SCIENCES	ANDHRA PRADESH	VISHAKHAPATNAM
469	GOA COLLEGE OF ENGINEERING (GOVERNMENT OF GOA)	GOA	NORTH GOA
470	VELAMMAL COLLEGE OF ENGINEERING & TECHNOLOGY	TAMIL NADU	MADURAI
471	SONA COLLEGE OF TECHNOLOGY	TAMIL NADU	SALEM
472	SHIV KUMAR SINGH INSTITUTE OF TECHNOLOGY & SCIENCE	MADHYA PRADESH	INDORE
473	JB INSTITUTE OF ENGINEERING AND TECHNOLOGY	TELANGANA	HYDERABAD
474	RKDF COLLEGE OF ENGINEERING	MADHYA PRADESH	BHOPAL
475	RKDF INSTITUTE OF SCIENCE & TECHNOLOGY	MADHYA PRADESH	BHOPAL
476	SRINIVASA INSTITUTE OF TECHNOLOGY & SCIENCE	ANDHRA PRADESH	YSR DISTRICT
477	B V RAJU INSTITUTE OF TECHNOLOGY	TELANGANA	MEDAK
478	BOMMA INSTITUTE OF TECHNOLOGY & SCIENCE	TELANGANA	KHAMMAM
479	NIST INSTITUTE OF SCIENCE AND TECHNOLOGY	ODISHA	GANJAM
480	MUFFAKHAM JAH COLLEGE OF ENGINEERING AND TECHNOLOGY	TELANGANA	HYDERABAD
481	BRILLIANT INSTITUTE OF ENGINEERING & TECHNOLOGY	TELANGANA	RANGAREDDI
482	S V S GROUP OF INSTITUTIONS	TELANGANA	WARANGAL
483	VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA	ODISHA	SAMBALPUR
484	VATHSALYA INSTITUTE OF SCIENCE & TECHNOLOGY	TELANGANA	NALGONDA
485	MATURI VENKATA SUBBA RAO ENGINEERING COLLEGE	TELANGANA	RANGAREDDI

486	SINHGAD ACADEMY OF ENGINEERING	MAHARASHTRA	PUNE
487	SINHGAD COLLEGE OF ENGINEERING	MAHARASHTRA	PUNE
488	CHAITANYA (DEEMED TO BE UNIVERSITY)	TELANGANA	WARANGAL
489	VIVEKANANDA INSTITUTE OF PROFESSIONAL STUDIES-TECHNICAL CAMPUS	DELHI	NORTH DELHI
490	MANIPAL ACADEMY OF HIGHER EDUCATION (OFF-CAMPUS CENTRE AT BENGALURU)	KARNATAKA	UDUPI
491	SREE SASTHA INSTITUTE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	THIRUVALLUR
492	INDRAPRASTHA INSTITUTE OF INFORMATION TECHNOLOGY DELHI	DELHI	SOUTH DELHI
493	MEDI CAPS UNIVERSITY INDORE	MADHYA PRADESH	INDORE
494	THENI KAMMAVAR SANGAM COLLEGE OF TECHNOLOGY	TAMIL NADU	THENI
495	AMRITA VISHWA VIDYAPEETHAM BENGALURU CAMPUS	KARNATAKA	BANGALORE URBAN
496	MALINENI SUSEELAMMA WOMEN'S ENGINEERING COLLEGE	ANDHRA PRADESH	PRAKASAM
497	MENTOR ACADEMY FOR DESIGN ENTREPRENEURSHIP INNOVATION AND TECHNOLOGY	KERALA	ERNAKULAM
498	SIDDAGANGA INSTITUTE OF TECHNOLOGY	KARNATAKA	TUMKUR
499	GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT GITAM OFF CAMPUS HYDERABAD	TELANGANA	MEDAK
500	GAYA COLLEGE OF ENGINEERING	BIHAR	GAYA
501	VIKAS GROUP OF INSTITUTIONS	ANDHRA PRADESH	KRISHNA
502	THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY DEEMED TO BE UNIVERSITY	PUNJAB	PATIALA
503	G. H. RAISONI COLLEGE OF ENGINEERING, NAGPUR.	MAHARASHTRA	NAGPUR
504	YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING	MAHARASHTRA	NAGPUR
505	ANANTHA LAKSHMI INSTITUTE OF TECHNOLOGY & SCIENCES	ANDHRA PRADESH	ANANTAPUR
506	KODADA INSTITUTE OF TECHNOLOGY & SCIENCE FOR WOMEN	TELANGANA	NALGONDA
507	SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	CHITTOOR
508	JODHPUR INSTITUTE OF ENGINEERING & TECHNOLOGY	RAJASTHAN	JODHPUR
509	SHADAN COLLEGE OF ENGINEERING & TECHNOLOGY	TELANGANA	RANGAREDDI
510	GNANAMANI COLLEGE OF TECHNOLOGY	TAMIL NADU	NAMAKKAL
511	INTERNATIONAL SCHOOL OF TECHNOLOGY AND SCIENCES FOR WOMEN	ANDHRA PRADESH	EAST GODAVARI
512	SRI ESHWAR COLLEGE OF ENGINEERING	TAMIL NADU	COIMBATORE
513	A.M.C. ENGINEERING COLLEGE	KARNATAKA	BANGALORE URBAN
514	PRIYADARSHINI COLLEGE OF ENGINEERING	MAHARASHTRA	NAGPUR
515	SANTHIRAM ENGINEERING COLLEGE	ANDHRA PRADESH	KURNOOL
516	K.S.R.M. COLLEGE OF ENGINEERING	ANDHRA PRADESH	YSR DISTRICT
517	SHREEYASH PRATISHTHAN'S, SHREEYASH COLLEGE OF ENGINEERING & TECHNOLOGY	MAHARASHTRA	AURANGABAD
518	VELLORE INSTITUTE OF TECHNOLOGY CHENNAI OFF CAMPUS	TAMIL NADU	KANCHIPURAM
519	PRIYADARSHNI INSTITUTE OF TECHNOLOGY & MANEGEMENT	ANDHRA PRADESH	GUNTUR
520	NARAYANA ENGINEERING COLLEGE	ANDHRA PRADESH	NELLORE
521	SREE RAMA ENGINEERING COLLEGE	ANDHRA PRADESH	CHITTOOR
522	ARJUN COLLEGE OF TECHNOLOGY AND SCIENCE	TELANGANA	RANGAREDDI
523	JYOTHISHMATHI INSTITUTE OF TECHNOLOGY & SCIENCE	TELANGANA	KARIMNAGAR
524	ST. MARY'S GROUP OF INSTITUTIONS GUNTUR FOR WOMEN	ANDHRA PRADESH	GUNTUR
525	BHARAT INSTITUTE OF ENGINEERING AND TECHNOLOGY	TELANGANA	RANGAREDDI
526	PPG INSTITUTE OF TECHNOLOGY	TAMIL NADU	COIMBATORE
527	ARM COLLEGE OF ENGINEERING AND TECHNOLOGY	TAMIL NADU	KANCHIPURAM

528	KAKINADA INSTITUTE OF TECHNOLOGY AND SCIENCE	ANDHRA PRADESH	EAST GODAVARI
529	CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY	TELANGANA	RANGAREDDI
530	SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY	ANDHRA PRADESH	WEST GODAVARI
531	HOLY MARY INSTITUTE OF TECHNOLOGY & SCIENCE	TELANGANA	RANGAREDDI
532	GRAPHIC ERA DEEMED TO BE UNIVERSITY	UTTARAKHAND	DEHRADUN
533	KARPAGAM ACADEMY OF HIGHER EDUCATION	TAMIL NADU	COIMBATORE
534	VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF TECHNOLOGY	MAHARASHTRA	MUMBAI SUBURBAN
535	VELLORE INSTITUTE OF TECHNOLOGY	TAMIL NADU	VELLORE
536	NATIONAL INSTITUTE OF TECHNICAL TEACHERS' TRAINING AND RESEARCH	MADHYA PRADESH	BHOPAL
537	VIGNANS FOUNDATION FOR SCIENCE TECHNOLOGY AND RESEARCH DEEMED TO BE UNIVERSITY OFF CAMPUS HYDERABAD	TELANGANA	NALGONDA
538	BIJU PATNAIK UNIVERSITY OF TECHNOLOGY ODISHA	ODISHA	SUNDERGARH
539	MAHARANA PRATAP INSTITUTE OF TECHNOLOGY	UTTAR PRADESH	GORAKHPUR
540	SCMS SCHOOL OF ENGINEERING & TECHNOLOGY	KERALA	ERNAKULAM

Annexure 4

List of ITIs in proximity of the Semiconductor industries

SL. NO.	ITI NAME	STATE/UT	DISTRICT
1	ACHARYA INDUSTRIAL TRAINING INSTITUTE	KARNATAKA	BENGALURU URBAN
2	AICMEU'S PRIVATE INDUSTRIAL TRAINING INSTITUTE	MAHARASHTRA	MUMBAI SUBURBAN
3	ALWAR PRIVATE INDUSTRIAL TRAINING INSTITUTE OLD INDUSTRIAL AREA	RAJASTHAN	ALWAR
4	ANAND PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
5	ANJUMAN- I-ISLAM M.H.SABOO SIDDIK PRIVATE INDUSTRIAL TRAINING INSTITUTE	MAHARASHTRA	MUMBAI
6	ANJUMANS OMAR TECHNICAL TRAINING CENTRE	TELANGANA	HYDERABAD
7	ANNAPOORNA INDUSTRIAL TRAINING CENTRE	TELANGANA	HYDERABAD
8	ANSH PRIVATE ITI	RAJASTHAN	ALWAR
9	APPROPRIATE TECHNOLOGY KENDRA,GUJARAT VIDYAPITH PRIVATE ITI, GIA SHAHIBAG (GRANT IN AID)	GUJARAT	AHMADABAD
10	APPROPRIATE TECHNOLOGY KENDRA,GUJARAT VIDYAPITH PRIVATE ITI, SF SAHIBAG (SELF FINANCE)	GUJARAT	AHMADABAD
11	ARAVALI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
12	ARAVALI PRIVATE INDUSTRIAL TRAINING INSTITUTE KHAWASJIKA BAGH RAJGARH	RAJASTHAN	ALWAR
13	ARAVINDA ITC	KARNATAKA	BENGALURU RURAL
14	ARAWALI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
15	ARNOLD PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
16	ASHOK PRIVATE ITI	KARNATAKA	BENGALURU URBAN
17	ASHUDEEP PRIVATE INDUSTRIAL TRAINING INSTITUTE, KHEDLI	RAJASTHAN	ALWAR
18	ASSOCIATION OF PEOPLE WITH DISABILITY PRIVATE ITI	KARNATAKA	BENGALURU URBAN
19	ATAL PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
20	AUMKAR PRIVATE ITI	GUJARAT	AHMADABAD
21	BAJRANG PRIVATE INDUSTRIAL TRAINING INSTITUTE SAMALA ROAD	RAJASTHAN	ALWAR
22	BALAJI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
23	BANSUR GOVERNMENT ITI	RAJASTHAN	ALWAR
24	BANSUR PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
25	BARGUR CO OP PRIVATE INDUSTRIAL TRAINING INSTITUTE	TAMIL NADU	KRISHNAGIRI
26	BASAVESHWARA INDUSTRIAL TRAINING THINDLU	KARNATAKA	BENGALURU URBAN
27	BASAVESHWARA ITC MAGADI ROAD	KARNATAKA	BENGALURU URBAN
28	BASIC TRAINING CENTRE TUMKUR ROAD	KARNATAKA	BENGALURU URBAN

29	BASSO DEVI LAXMAN SINGH PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
30	BAWA NIHAL SINGH PRIVATE ITI	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
31	BHAGWAN MAHAVEER PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
32	BHARAT PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
33	BHUVAN INDUSTRIAL TRAINING CENTRE VENKATALA	KARNATAKA	BENGALURU URBAN
34	BIBI FATHIMA EDUCATIONAL TRUST CRESENT ITI	KARNATAKA	BENGALURU URBAN
35	BILVA ITC	KARNATAKA	BENGALURU URBAN
36	BL PRIVATE ITI	RAJASTHAN	ALWAR
37	BOMBAY TECHNICAL SCHOOL OF ENGINEERING	MAHARASHTRA	MUMBAI
38	BOYS TOWN INDUSTRIAL TRAINING CENTRE	TELANGANA	HYDERABAD
39	BRAJLATA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
40	BRAJPAL PRIVATE INDUSTRIAL TRAINING INSTITUTE GRAM RELA	RAJASTHAN	ALWAR
41	BTL INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
42	CHETANYA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
43	COMPUTER TECHNOLOGY FOUNDATION PRIVATE ITI, SF COMPUTER TECHNOLOGY (SELF FINANCE)	GUJARAT	AHMADABAD
44	CRESCENT PRIVATE ITI	KARNATAKA	BENGALURU URBAN
45	DEEP PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
46	DESAI K.J. GOVERNMENT TECHNICAL HIGHSCHOOL, VIRAMGAM	GUJARAT	AHMADABAD
47	DEV PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
48	DHRUV PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
49	DIVYA JYOTHI INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU RURAL
50	DON BOSCO PRIVATE ITI	MAHARASHTRA	MUMBAI SUBURBAN
51	DR. IBRAHIM KAZIM, PRIVATE ITI, GIA DHOLKA (GRANT IN AID)	GUJARAT	AHMADABAD
52	E.T.C. PRIVATE INDUSTRIAL TRAINING INSTITUTE MOHAN NAGAR	RAJASTHAN	ALWAR
53	ER PERUMAL MANIMEGALAI PRIVATE INDUSTRIAL TRAINING INSTITUTE	TAMIL NADU	KRISHNAGIRI
54	EVEREST PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
55	FR. AGNEL PRIVATE INDUSTRIAL TRAINING INSTITUTE	MAHARASHTRA	MUMBAI SUBURBAN
56	GAURAV PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
57	GHOUSIA INDUSTRIAL TRAINING INSTITUTE	KARNATAKA	BENGALURU URBAN
58	GLOBE I.T.C., OBALAPPA GARDEN, BANGALORE.	KARNATAKA	BENGALURU URBAN
59	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE RAINI	RAJASTHAN	ALWAR
60	GOVERNMENT INDUSTRAIL TRAINING INSTITUTE THANAGAJI	RAJASTHAN	ALWAR

61	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE (MINORITY), MANDAVI, DIST: MUMBAI SHAHAR	MAHARASHTRA	MUMBAI
62	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE (MINORITY), CHANDIVALI, DIST: MUMBAI SHAHAR	MAHARASHTRA	MUMBAI SUBURBAN
63	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE (WOMAN), DADAR, DIST: MUMBAI SAHAR	MAHARASHTRA	MUMBAI
64	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE , PEENYA	KARNATAKA	BENGALURU URBAN
65	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE ALWAR	RAJASTHAN	ALWAR
66	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE DETROJ	GUJARAT	AHMADABAD
67	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, ANDHERI,	MAHARASHTRA	MUMBAI SUBURBAN
68	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, BHIWADI	RAJASTHAN	ALWAR
69	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, BORIVALI, DIST: MUMBAI SUBURBUN	MAHARASHTRA	MUMBAI SUBURBAN
70	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, DADAR, DIST: MUMBAI SHAHAR	MAHARASHTRA	MUMBAI
71	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, GOVANDI, DIST: MUMBAI SAHAR	MAHARASHTRA	MUMBAI SUBURBAN
72	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, KURLA, DIST: MUMBAI SAHAR	MAHARASHTRA	MUMBAI SUBURBAN
73	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, LOWER PAREL, DIST: MUMBAI SAHAR	MAHARASHTRA	MUMBAI
74	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, MULUND, DIST: MUMBAI SAHAR	MAHARASHTRA	MUMBAI SUBURBAN
75	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, MUMBAI-1, DIST: MUMBAI SHAHAR	MAHARASHTRA	MUMBAI
76	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, MUMBAI-11, DIST: MUMBAI SAHAR	MAHARASHTRA	MUMBAI
77	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE, RAJGARH	RAJASTHAN	ALWAR
78	GOVERNMENT INDUSTRIAL TRAINING INSTITUTE,HOSUR	TAMIL NADU	KRISHNAGIRI
79	GOVERNMENT ITI NELAMANGALA	KARNATAKA	BENGALURU RURAL
80	GOVERNMENT TECHNICAL HIGH SCHOOL , GTHS AHMEDABAD (TECHNICAL)	GUJARAT	AHMADABAD
81	GOVERNMENT WOMEN INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
82	GOVT INDUSTRAIL TRAINING CENTRE FOR WOMEN HOSUR ROAD	KARNATAKA	BENGALURU URBAN
83	GOVT INDUSTRIAL TRAINING INSTITUTE	TELANGANA	HYDERABAD
84	GOVT INDUSTRIAL TRAINING INSTITUTE (W) DERABASSI	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
85	GOVT INDUSTRIAL TRAINING INSTITUTE (W) KHARAR	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
86	GOVT INDUSTRIAL TRAINING INSTITUTE BANUR	PUNJAB	SAHIBZADA AJIT SINGH NAGAR

87	GOVT INDUSTRIAL TRAINING INSTITUTE DEVANAHALLI	KARNATAKA	BENGALURU RURAL
88	GOVT INDUSTRIAL TRAINING INSTITUTE FOR WOMEN	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
89	GOVT INDUSTRIAL TRAINING INSTITUTE, LALRU,	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
90	GOVT INDUSTRIAL TRAINING INSTITUTE, MALLEPALLY	TELANGANA	HYDERABAD
91	GOVT INDUSTRIAL TRAINING INSTITUTE, MUSHEERABAD	TELANGANA	HYDERABAD
92	GOVT INDUSTRIAL TRAINING INSTITUTE,ANEKAL NAGARA	KARNATAKA	BENGALURU URBAN
93	GOVT ITI (W) HOSAKEREHALLI	KARNATAKA	BENGALURU URBAN
94	GOVT ITI DOMLUR	KARNATAKA	BENGALURU URBAN
95	GOVT ITI HOSKOTE	KARNATAKA	BENGALURU RURAL
96	GOVT ITI, NEEMRANA	RAJASTHAN	ALWAR
97	GOVT. ITI MORIGAON	ASSAM	MARIGAON
98	GOVT. ITI, MEN HOSUR ROAD	KARNATAKA	BENGALURU URBAN
99	GOVT. ITI, VIJAYANAGAR COLONY (FORMERLY T.E. RICC) MALLEPALLY, HYDERABAD	TELANGANA	HYDERABAD
100	GOVT. ITI, DODDABALLAPURA	KARNATAKA	BENGALURU RURAL
101	GOVT. ITI, KHAIRATABAD	TELANGANA	HYDERABAD
102	GOVT. ITI, RAMGARH	RAJASTHAN	ALWAR
103	GOVT. ITI, SHANTHINAGAR, HYDERABAD	TELANGANA	HYDERABAD
104	GOVT. ITI, YESHWANTHPURA	KARNATAKA	BENGALURU URBAN
105	GOVT. QQSITI FOR GIRLS, SANTOSHNAGAR, HYDERABAD	TELANGANA	HYDERABAD
106	GOVT.ITI, DHOLKA	GUJARAT	AHMADABAD
107	GOVT.ITI, BAVLA	GUJARAT	AHMADABAD
108	GOVT.ITI, MANDAL	GUJARAT	AHMADABAD
109	GOVT.ITI, RANIP-GOTA	GUJARAT	AHMADABAD
110	GPS PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
111	GS INDUSTRIAL TRAINING INSTITUTE	KARNATAKA	BENGALURU RURAL
112	GS ITI PILLAGUMPE	KARNATAKA	BENGALURU RURAL
113	GUARDIAN PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
114	GURU KRIPA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
115	GYANDEEP PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
116	H.K. MEMORIAL PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
117	HABIB TECHNICAL INSTITUTE	MAHARASHTRA	MUMBAI
118	HANS PRIVATE ITI	RAJASTHAN	ALWAR
119	HASAN KHAN MEWATI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
120	HAZARATH HMEED SHAH & HAZARATH MUHEEB SHAH INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
121	HEH THE NIZAM ALLADIN TECHNICAL CENTRE INDUSTRIAL TRAINING CENTRE	TELANGANA	HYDERABAD
122	HYDERABAD TECHNICAL COLLEGE ITC	TELANGANA	HYDERABAD

123	INDIAN PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
124	INDIRAMMA AM. & DR. RAMAIAH INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
125	INDO GERMAN TOOL ROOM - AHMEDABAD	GUJARAT	AHMADABAD
126	INDUSTRIAL TRAINING CENTRE (GIA) BLIND PEOPLE'S ASSOCIATION	GUJARAT	AHMADABAD
127	INDUSTRIAL TRAINING INSTITUTE (W), THALTEJ,(WOMEN) AHMEDABAD (GOVERNMENT)	GUJARAT	AHMADABAD
128	INDUSTRIAL TRAINING INSTITUTE, CHANDKHEDA (GOVERNMENT)	GUJARAT	AHMADABAD
129	INDUSTRIAL TRAINING INSTITUTE, DHANDHUKA (GOVERNMENT)	GUJARAT	AHMADABAD
130	INDUSTRIAL TRAINING INSTITUTE, KUBERNAGAR (GOVERNMENT)	GUJARAT	AHMADABAD
131	INDUSTRIAL TRAINING INSTITUTE, MANINAGAR (KHOKHRA) (GOVERNMENT)	GUJARAT	AHMADABAD
132	INDUSTRIAL TRAINING INSTITUTE, SANAND (GOVERNMENT)	GUJARAT	AHMADABAD
133	INDUSTRIAL TRAINING INSTITUTE, SARASPUR (GOVERNMENT)	GUJARAT	AHMADABAD
134	INDUSTRIAL TRAINING INSTITUTE, SARKHEJ (GOVERNMENT)	GUJARAT	AHMADABAD
135	INDUSTRIAL TRAINING INSTITUTE, VIRAMGAM (GOVERNMENT)	GUJARAT	AHMADABAD
136	J C S INDUSTRIAL TRAINING INSTITUTE NELAMANGALA	KARNATAKA	BENGALURU RURAL
137	JAFFERIA TECHNICAL INSTITIUTE INDUSTRIAL TRAINING CENTRE	TELANGANA	HYDERABAD
138	JAI DURGA PANCHWATI PRIVATE ITI	RAJASTHAN	ALWAR
139	JAI DURGA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
140	JOSEPH CARDIJN TECHNICAL,INDUSTRIAL TRAINING CENTER	MAHARASHTRA	MUMBAI
141	JRS ITI NELAMANGALA	KARNATAKA	BENGALURU RURAL
142	K.J. SOMAIYA PRIVATE INDUSTRIAL TRAINING INSTITUTE	MAHARASHTRA	MUMBAI SUBURBAN
143	K.S.B.TECHANICAL INSTITUTE,, GIA ITI SANAND (GRANT IN AID)	GUJARAT	AHMADABAD
144	KKMP INDUSTRAIL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
145	LABHANSHIKA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
146	LALJI MEHROTRA TECHNICAL INSTITUTE	MAHARASHTRA	MUMBAI SUBURBAN
147	LAXMI DEVI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
148	LAXMI DEVI PRIVATE INDUSTRIAL TRAINING INSTITUTE BEHRAR	RAJASTHAN	ALWAR
149	LOYOLA TECHNICAL INSTITUTE ITC	KARNATAKA	BENGALURU URBAN
150	LR PRIVATE ITI	RAJASTHAN	ALWAR
151	M V M PRIVATE ITI	KARNATAKA	BENGALURU RURAL
152	M.C.E.B.T.I. INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
153	M.S. PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
154	MADRAS ENGINEER GROUP & CENTRE GOVT-ITI	KARNATAKA	BENGALURU URBAN
155	MAHARAJA PVT. I.T.I	RAJASTHAN	ALWAR

156	MAHATMA GANDHI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
157	MANINAGAR-VASTRAL(MAHILA) GOVERNMENT ITI	GUJARAT	AHMADABAD
158	MANORAMA INDUSTRIAL TRAINING CENTRE	TELANGANA	HYDERABAD
159	MANVI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
160	MATA GUJRI ITC	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
161	MATSAYA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
162	MATSAYA LOKSEWA PRIVATE INDUSTRIAL TRAINING INSTITUTE,	RAJASTHAN	ALWAR
163	MATSAYA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
164	MAULANA AZAD NATIONAL URDU UNIVERSITY, INDUSTRIAL TRAINING INSTITUTE GACHIBOWLI, HYDERABAD	TELANGANA	HYDERABAD
165	MAULANA AZAD NATIONAL URDU UNIVERSITY-ITC	KARNATAKA	BENGALURU URBAN
166	MG PRIVATE ITI	RAJASTHAN	ALWAR
167	MILLAT INDUSTRIAL TRAINING CENTRE	TELANGANA	HYDERABAD
168	MODERN PRIVATE INDUSTRIAL TRAINING INSTITUTE,	RAJASTHAN	ALWAR
169	MT. MALARI INDUSTRIAL TRAINING INSTITUTE	KARNATAKA	BENGALURU URBAN
170	MUSLIM ORPHANAGE INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
171	MVM TAKSHASHILA ITC VARANASI TCPALYA POST BANGALORE	KARNATAKA	BENGALURU URBAN
172	NATIONAL INSTITUTE OF TECHNOLOGY	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
173	NATIONAL SKILL TRAINING INSTITUTE (WOMEN), BANGALORE	KARNATAKA	BENGALURU URBAN
174	NATIONAL SKILL TRAINING INSTITUTE (WOMEN), MUMBAI	MAHARASHTRA	MUMBAI
175	NATIONAL SKILL TRAINING INSTITUTE(NSTI)(CAMPUS-I),BENGALURU	KARNATAKA	BENGALURU URBAN
176	NATIONAL SKILL TRAINING INSTITUTE, VIDYANAGAR CAMPUS, HYDERABAD	TELANGANA	HYDERABAD
177	NATIONAL SKILL TRAINING INSTITUTE,MUMBAI	MAHARASHTRA	MUMBAI
178	NATIONAL SKILL TRAINING INSTITUTE,RAMANTHAPUR,HYDERABAD	TELANGANA	HYDERABAD
179	NATIONAL SKILL TRAINING INSTITUTE-2,BENGALURU	KARNATAKA	BENGALURU URBAN
180	NATIONAL SKILL TRAINING INSTITUTE(WOMEN),VIDYANAGAR,HYDERABAD	TELANGANA	HYDERABAD
181	NAVODYA INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
182	NETHAJI INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
183	NEW ANGEL INDUSTRIAL TRAINING CENTRE	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
184	NEW TAGORE PRIVATE INDUSTRIAL TRAINING INSTITUTE GRAM BUDHI BAWAL	RAJASTHAN	ALWAR
185	NIRMALA JYOTHI TECHNICAL INSTITUTE	KARNATAKA	BENGALURU URBAN
186	NRI PVT. ITI	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
187	NTTF INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
188	P.D. PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR

189	P.D. PRIVATE INDUSTRIAL TRAINING INSTITUTE, GANDALA	RAJASTHAN	ALWAR
190	P.K. MEMORIAL PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
191	PARISHKAR PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
192	PRAGATHI INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU RURAL
193	PRAGATHI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
194	PRET RAJ PRIVATE ITI	RAJASTHAN	ALWAR
195	PVP ITC JNABARATHI CAMPUS MALLATHAHALLI	KARNATAKA	BENGALURU URBAN
196	R.L. JALAPPA ITC KODIGEHALLI DODDABALLAPUR	KARNATAKA	BENGALURU RURAL
197	R.R. PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
198	RAGHAVENDRA ITC	KARNATAKA	BENGALURU URBAN
199	RAJALAKSHMI INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU RURAL
200	RAJASTHAN PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
201	RAJRISHI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
202	RAMAN INDUSTRIAL TRAINING CENTRE KAMAKSHI PALYA	KARNATAKA	BENGALURU URBAN
203	RANJEET PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
204	RANJEET ROYAL PRIVATE ITI	RAJASTHAN	ALWAR
205	RAO PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
206	RAO PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
207	REGIONAL PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
208	S.V.C.K. FRIENDS CULTURAL EDUCATIONAL SOCIETY	KARNATAKA	BENGALURU URBAN
209	SAI KRUPA INDUSTRIAL TRAINING CENTRE	TELANGANA	HYDERABAD
210	SANKALP PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
211	SARASWATI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
212	SAROJDEVI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
213	SARVESH PRIVATE INDUSTRIAL TRAINING INSTITUTE MOONPUR	RAJASTHAN	ALWAR
214	SARVESH PRIVATE INDUSTRIAL TRAINING INSTITUTE, RAJGARH	RAJASTHAN	ALWAR
215	SARVODAY PRIVATE INDUSTRIAL TRAINING INSTITUTE ADRASH COLONY DAUDPUR	RAJASTHAN	ALWAR
216	SARVODAYA PRIVATE INDUSTRIAL TRAINING INSTITUTE KISHANGARH BASS	RAJASTHAN	ALWAR
217	SEA ITC EKTA NAGAR BASAVANAPURA VIRGO NAGAR POST	KARNATAKA	BENGALURU URBAN
218	SHANKARI INDUSTRIAL TRAINING INSTITUTE DABASPET	KARNATAKA	BENGALURU RURAL
219	SHARDASHRAM VIDYAMANDIR, INDUSTRIAL TRAINING CENTER	MAHARASHTRA	MUMBAI
220	SHREE HEERANAND PRIVATE INDUSTRIAL TRAINING INSTITUTE BILCOHI KA KAUN	RAJASTHAN	ALWAR

221	SHREE MANAV SEVA SANGH SANCHALIT SMT. SAVITRIBEN AND SHRI. NENUMAL PARDASANI PRIVATE INDUSTRIAL TRAI	MAHARASHTRA	MUMBAI
222	SHREE MATSYA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
223	SHREE PRAKASH RAO PRIVATE ITI	RAJASTHAN	ALWAR
224	SHREE SHYAM PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
225	SHRI AGRASEN PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
226	SHRI BALAJI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
227	SHRI BHAGVAT VIDYAPITH ASHOK ITC, GIA SOLA (GRANT IN AID)	GUJARAT	AHMADABAD
228	SHRI BHAWANI SHANKAR PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
229	SHRI G.V.GANDHI GURUKUL PRIVATE I.T.I	MAHARASHTRA	MUMBAI SUBURBAN
230	SHRI GANESH PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
231	SHRI GIRIRAJ PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
232	SHRI JEMI M. ZAVERI AND SHRI ROOPCHAND BHATIA PVT. ITI	MAHARASHTRA	MUMBAI SUBURBAN
233	SHRI KRISHAN PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
234	SHRI KRISHNA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
235	SHRI NATH PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
236	SHRI RADHAKRISHAN PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
237	SHRI SAI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
238	SHRI SHYAM PRIVATE ITI	RAJASTHAN	ALWAR
239	SHRI SIDDESWARA INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU RURAL
240	SHRI SIDDHI VINAYAK PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
241	SHRI VINAYAK PVT. I.T.I	RAJASTHAN	ALWAR
242	SHRI VISHAVKARMA PRIVATE INDUSTRIAL TRAINING INSTITUTE, RAJGARH	RAJASTHAN	ALWAR
243	SHUKLA PRIVATE ITI	RAJASTHAN	ALWAR
244	SORABH PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
245	SREE SIDDAGANGA INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU RURAL
246	SRI AYYAPPAN I.T.C	KARNATAKA	BENGALURU URBAN
247	SRI BANASHANKARI ITC	KARNATAKA	BENGALURU RURAL
248	SRI K SHIVARAM INDUSTRAIL TRAINING CENTRE RAMANMURTHY NAGAR	KARNATAKA	BENGALURU URBAN
249	SRI KRISHNA INDUSTRIAL TRAINING CENTRE DEVANAHALLI	KARNATAKA	BENGALURU RURAL
250	SRI RAMACHANDRA INDUSTRIAL TRAINING CENTRE	TELANGANA	HYDERABAD
251	SRI SATYANARAYANA INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
252	SRI SRINIVASA ITI	KARNATAKA	BENGALURU URBAN

253	SRI VIDYA INDUSTRIAL TRAINING INSTITUTE	KARNATAKA	BENGALURU URBAN
254	SRI. NIMISHAMBA PVT ITI,	KARNATAKA	BENGALURU RURAL
255	SRINIVASA ITC , NAYANADAHALLI	KARNATAKA	BENGALURU URBAN
256	ST JOSEPH INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
257	ST JOSEPH PRIVATE INDUSTRIAL TRAINING INSTITUTE	TAMIL NADU	KRISHNAGIRI
258	ST. FRANCIS PRIVATE INDUSTRIAL TRAINING INSTITUTE	MAHARASHTRA	MUMBAI SUBURBAN
259	ST. PATRICK'S ITC	KARNATAKA	BENGALURU URBAN
260	SWAMY VIVEKANANDA PRIVATE ITI	KARNATAKA	BENGALURU RURAL
261	TAGORE PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
262	TAKSHILA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
263	THE CHILDRENS AID SOCIETYS PVT. INDUSTRIAL TRAINING INSTITUTE MANKHURD	MAHARASHTRA	MUMBAI SUBURBAN
264	THE PEOPLE'S BANK UNITED PRIVATE ITI, GIA DHOLKA (GANIPUR) (GRANT IN AID)	GUJARAT	AHMADABAD
265	TIRUPATI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
266	TRAINING CENTRE FOR THE ADULT DEAF GOVT. INDUSTRIAL TRAINING INSTITUTE	TELANGANA	HYDERABAD
267	U.B.M. PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
268	UTHANGARAI PRIVATE INDUSTRIAL TRAINING INSTITUTE	TAMIL NADU	KRISHNAGIRI
269	VANSHIKA PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
270	VEERABHADRESHWARA INDUSTRAIL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
271	VIDHYASTHALI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
272	VIDYASHREE INDUSTRIAL TRAINING CENTRE	KARNATAKA	BENGALURU URBAN
273	VIJAY ATUL PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
274	VIKAS PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
275	VINAYAK PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
276	VIRAMGAM GOVERNMENT ITI	GUJARAT	AHMADABAD
277	VIRAT PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
278	VIVEKANAND PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR
279	VIVEKANAND PRIVATE INDUSTRIAL TRAINING INSTITUTE, BIBIRANI	RAJASTHAN	ALWAR
280	VOKKALIGARA SANGH I.T.I	KARNATAKA	BENGALURU URBAN
281	W. C. INDUSTRIAL TRAINING CENTRE	PUNJAB	SAHIBZADA AJIT SINGH NAGAR
282	YADUVANSHI PRIVATE INDUSTRIAL TRAINING INSTITUTE	RAJASTHAN	ALWAR