Government of India
Ministry of Skill Development and Entrepreneurship
Directorate General of Training (DGT)

National Skill Training Institute
Chennai

Directorate General of Training

NSTI Chennai: Facilities and Roadmap for Advanced Manufacturing NCoE under PM SETU

1. Background and Institutional Legacy

- **National Skill Training Institute (NSTI)**, Chennai is one of the oldest and premier institutes under the Directorate General of Training (DGT), Ministry of Skill Development and Entrepreneurship, Government of India.
- The institute was originally **established in 1962 as Central Training Institute (CTI) for instructor training**, subsequently developed as **Model Training Institute in 1964**, **and upgraded as Advanced Training Institute in 1968 with UNDP/ILO assistance.**
- Over the last six decades, the institute has served as a **national-level institution for Craft Instructor Training, Advanced Vocational Training, short-term industrial upskilling and technical capacity building.**
- NSTI Chennai is located at Guindy Industrial Estate, Chennai, **in close proximity to major industries,** MSMEs and reputed institutions such as IIT Madras, Anna University, MSME, NSIC, CIPET and other technical institutions.

2. Present Institutional Role

Area	Present Role of NSTI Chennai
Instructor Training	Training of Craft Instructors for ITIs and vocational training institutions through CITS.
Advanced Vocational Training	Short-term upskilling and reskilling for industry, PSUs, government organisations and technical personnel.
Technical Capacity Building	Training for engineers, supervisors, technicians, trainers, faculty and working professionals.
Industry-oriented Courses	Modular and tailor-made courses based on industry and institutional requirements.
Emerging Technology Training	AI, Drone, Solar, EV, CAD/CAM, CNC, automation and related new-age programmes.

3. Existing Campus and Physical Infrastructure

NSTI Chennai has a strong physical and residential infrastructure base which can support further expansion as a National Centre of Excellence.

Facility	Details
Main RDSDE / NSTI Campus	21 acres.
CITS Hostel Campus	10.68 acres; 109 rooms; approximately 600 occupancy.
AVTS Hostel Campus	*6.7 acres; 100 rooms with attached bath) ; 100 occupancy*
New Girls' Hostel	*Under construction; proposed 30 rooms / 60 occupancy.*
Staff Quarters	99 quarters from Type I to Type V.
Conference Hall	Well-equipped conference hall with around 400-seat capacity.
Other Facilities	Canteen, dispensary, classrooms, workshops, laboratories and residential facilities.

4. Training Infrastructure

Training Facility	Existing Strength
Classrooms	20 classrooms for long-term and short-term training programmes.
CITS Laboratories / Sections	Facilities for instructor training in engineering and non-engineering trades.
AVTS Sections	13 advanced short-term training sections.
CTS Trades	3 new-age CTS trades presently introduced.
Workshops and Labs	CNC, CAD/CAM, Welding, Automotive, Hydraulics, Pneumatics, Electronics, Process Control, Metrology, Tool & Die and Production Technology facilities.

5. Training Programmes Conducted

Scheme / Programme	Nature of Training
Craft Instructor Training Scheme (CITS)	One-year instructor training for ITI and vocational training ecosystem.
Craftsmen Training Scheme (CTS)	Long-term trade training, including new-age trades.
Advanced Vocational Training Scheme (AVTS)	Short-term advanced upskilling / reskilling courses, generally 1 to 4 weeks.
Apprenticeship Training Scheme / NAPS	***Apprenticeship promotion, monitoring and industry linkage. - RDSDE***
PM Vishwakarma	***Skill support for traditional artisans and related beneficiaries. - RDSDE***
PM Surya Ghar Muft Bijli Yojana	***Solar-related training and capacity building.***
Jan Shikshan Sansthan Monitoring	***Monitoring of JSS activities under RDSDE jurisdiction.***

6. CITS, CTS and AVTS Strength

NSTI Chennai has a balanced mix of instructor training, new-age long-term training and advanced short-term industrial skilling.

Category	Trades / Areas
CITS Trades	Fitter, Electrician, Electronic Mechanic, Mechanic Motor Vehicle, Mechanic Diesel, Tool and Die Maker, Welder, Computer Software Application, Draughtsman Civil, Plumber, Surveyor, Sewing Technology and Wood Work Technician.
New-age CTS Trades	Artificial Intelligence Programming Assistant, Drone Technician and Solar Technician. Semiconductor Technician is proposed to be introduced in future, subject to approval.
AVTS / Short-term Areas	Advanced Welding, Automotive Technology, Machine Tool Maintenance, Metrology and Engineering Inspection, Pneumatic and Hydraulic Controls, Electronic Controls and Maintenance, CNC Centre, CAD Centre, Process Control Instrumentation, Heat Treatment and Material Testing, Production Technology, uPVC Carpentry and Jaquar Plumbing.

7. Recent Initiatives and Modernisation Efforts

Area	Initiative / Present Development
Artificial Intelligence	AI Programming Assistant trade and AI lab support through **Microsoft CSR.**
Drone Technology	Introduction of Drone Technician trade.
Solar Technology	Solar Technician trade and PM Surya Ghar-related skilling.
Electric Vehicle	EV lab initiative with industry / CSR support by **Shell India**
Electrical Technology	Switch gears, Circuit Breakers, Drives and Motors – CSR by **Siemens**
CNC / CAD / CAM	**SinuTrain simulators, Solid Edge, Solid CAM**, Turn Mill Centre and CNC-related facilities – Partly CSR support **from Siemens**
Automation	PLC, pneumatics, hydraulics and process control facilities.
Industry 4.0	Smart manufacturing, PLC/SCADA, additive manufacturing and EV technologies.
Campus Development	New girls' hostel, campus improvement and trainee welfare initiatives.
Industry Linkage	CSR-supported labs, industry-aligned training and scope for OEM / technology partner involvement.

8. Strategic Advantage of NSTI Chennai

Strength	Relevance
Institutional Legacy	More than six decades of experience in instructor training and advanced vocational training.
Location Advantage	Located in Chennai, one of India's major automotive, electronics, engineering and manufacturing hubs.

Strength	Relevance
Existing Infrastructure	Large campus, workshops, hostels, advanced labs and training sections already available.
Industry Ecosystem	Surrounded by industries, MSMEs, academic institutions and technical organisations.
Trainer Training Mandate	Apex DGT institution for capacity building of instructors and trainers.
Future Skill Potential	Suitable for EV, precision machining, Industry 4.0, Digital Twin, robotics, microelectronics and semiconductor-related skilling.

9. PM SETU: National Centre of Excellence in Advanced Manufacturing

NSTI Chennai is proposed to be developed as a National Centre of Excellence in Advanced Manufacturing under PM SETU. The proposed Centre may build upon the existing strengths of the institute and progressively integrate new-age manufacturing technologies relevant to Indian industry and future employment.

Proposed Domain	Scope
Automotive and EV Technologies	EV systems, battery systems, vehicle electronics, diagnostics and service technology.
Precision Machining	CNC, CAD/CAM, tool and die making, metrology, calibration and high-precision component manufacturing.
Digital Twin	Simulation of machines, production lines, maintenance systems and smart factory operations.
Industry 4.0	Industrial IoT, PLC, SCADA, robotics, automation, sensor integration and cyber-physical systems.
Additive Manufacturing	3D printing, rapid prototyping and advanced product development.
Microelectronics	Embedded systems, PCB design, electronics testing and electronics manufacturing.
Semiconductor Skilling	Semiconductor process awareness, VLSI basics, packaging, testing and lab-to-fab orientation.
Advanced Welding	AR/VR-based welding, robotic welding and advanced fabrication.
Predictive Maintenance	Sensor-based condition monitoring, AI-based maintenance and industrial analytics.

10. Proposed Functional Model

Functional Pillar	Proposed Activity
Trainer Capacity Building	Advanced ToT, refresher training and induction training for ITI instructors.
Faculty Development	Upskilling of Polytechnic and Engineering faculty in advanced technologies.

Functional Pillar	Proposed Activity
Industry Workforce Upskilling	Short-term modular programmes for MSMEs, large industries, PSUs, government technical staff and defence personnel.
Advanced Manufacturing Labs	Upgradation of CNC, CAD/CAM, welding, metrology, robotics, automation and precision manufacturing facilities.
Emerging Technology Labs	EV, Digital Twin, Industry 4.0, microelectronics and semiconductor-oriented labs.
Industry Collaboration	CSR support, guest faculty, live projects, apprenticeship, placement and technology demonstration.

11. PM SETU Readiness

The proposed transformation is consistent with the broad objective of **PM SETU Component II**, which envisages capacity augmentation of selected NSTIs and setting up of National Centres of Excellence. For the present note, the focus is on NSTI Chennai's facilities and future development plan. Detailed implementation arrangements such as industry partner, global partner, Strategic Investment Plan and Annual Operational Plan may be taken up separately as per the PM SETU guidelines.

PM SETU Direction	NSTI Chennai Readiness
Capacity augmentation of NSTIs	Existing campus, workshops, hostels and training infrastructure provide a strong base for upgradation.
National Centre of Excellence	Advanced Manufacturing is a natural theme for NSTI Chennai considering its existing facilities and Chennai's industrial ecosystem.
Trainer development	Existing CITS mandate can be expanded into advanced ToT and faculty development.
Industry alignment	Existing AVTS and CSR-supported facilities can be strengthened through OEMs, MSMEs and technology partners.
Emerging technology courses	AI, Drone, Solar, EV, automation, Digital Twin, Industry 4.0, microelectronics and semiconductor skilling can be progressively introduced.

12. Suggested Advanced Short-Term Courses

Course Area	Suggested Courses
Industrial Automation	PLC, HMI, SCADA and industrial control systems.
Smart Manufacturing	Industry 4.0, IIoT and cyber-physical systems.
CNC and Precision Machining	CNC programming, machining, metrology and calibration.
Robotics	Industrial robotics, robotic welding and automation applications.
Additive Manufacturing	3D printing and rapid prototyping.
EV Technology	EV powertrain, battery systems, chargers and diagnostics.
Digital Twin	Manufacturing simulation and virtual commissioning.

Course Area	Suggested Courses
Semiconductor	Semiconductor process overview, VLSI basics, packaging and testing.
Microelectronics	PCB design, embedded systems and electronics manufacturing.
Predictive Maintenance	Sensors, data analytics and AI-based industrial maintenance.
Advanced Welding	AR/VR welding, TIG/MIG welding and industrial fabrication.

13. Support Required from DGT under PM SETU

Area	Support Required
Infrastructure	Upgradation of existing workshops and establishment of advanced laboratories.
Equipment	Modern equipment for EV, Industry 4.0, Digital Twin, robotics, microelectronics, precision manufacturing and semiconductor skilling.
Faculty / Experts	Engagement of domain experts and continuous capacity building of existing faculty.
Industry Partnership	Facilitation of CSR / industry partnerships with OEMs, technology companies and sector leaders.
Curriculum	Support for new-age short-term and long-term courses, including modular certification.
PM SETU	Prioritisation of NSTI Chennai for implementation of NCoE in Advanced Manufacturing under PM SETU Component II.
Budget	Provision of funds for infrastructure, equipment, hostel, campus improvement and trainee facilities.

14. Expected Outcomes

Outcome Area	Expected Impact
Instructor Training	Improved quality of ITI and vocational training through advanced trainer capacity building.
Faculty Development	Regular upskilling of Polytechnic and Engineering faculty in emerging technologies.
Industry Workforce	Reskilling and upskilling of workers, supervisors and technicians in advanced manufacturing.
MSME Support	Technology exposure and productivity improvement for local and regional MSMEs.
Semiconductor Ecosystem	Creation of entry-level and mid-level skilled manpower for electronics and semiconductor-related industries.
Apprenticeship and Placement	Improved industry linkage, apprenticeship opportunities and employability outcomes.
National Replication	Development of NSTI Chennai as a model institute for replication across other NSTIs and ITIs.

15. Conclusion

NSTI Chennai has the legacy, location, land, infrastructure, training experience and industry ecosystem required to become a National Centre of Excellence in Advanced Manufacturing. Its existing strengths in CITS, CTS, AVTS, CNC, CAD/CAM, welding, automotive, electronics, hydraulics, pneumatics, process control and short-term industry training provide a strong base for future upgradation.

With focused support from DGT, NSTI Chennai can be transformed into a future-ready institution covering Automotive, EV, Precision Machining, Digital Twin, Industry 4.0, Robotics, Microelectronics and Semiconductor-related skilling. This will strengthen national trainer capacity, support industrial workforce upskilling, promote apprenticeship and placement linkages, and position NSTI Chennai as a model institution for advanced technical skilling under DGT/MSDE.

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Visual Summary for DGT Senior Officials

Existing Strengths

- Established in 1962; upgraded as ATI in 1968.
- 21-acre main campus with hostels, workshops and residential facilities.
- Strong base in CITS, CTS, AVTS and short-term training.

Training Infrastructure

- 20 classrooms, CITS labs and 13 AVTS sections.
- CNC, CAD/CAM, Welding, Automotive, Hydraulics and Pneumatics.
- Electronics, Process Control, Metrology and Tool & Die facilities.

Transformation Objective

Existing Facilities → **PM SETU Upgradation** → **National CoE Advanced Manufacturing**

To upgrade NSTI Chennai as a future-ready national hub for trainer capacity building, advanced industrial skilling and emerging technology training.

Proposed NCoE Domains

Automotive & EV
EV systems, battery and diagnostics

Precision Machining
CNC, CAD/CAM, Tool & Die and metrology

Digital Twin
Simulation and virtual commissioning

Industry 4.0
IIoT, PLC, SCADA, robotics and automation

Microelectronics
Embedded systems, PCB and electronics testing

Semiconductor Skilling
VLSI basics, packaging and fab orientation

Additive Manufacturing
3D printing and rapid prototyping

Predictive Maintenance
Sensors and AI-based industrial analytics

Functional Model

Trainer Capacity Building
Advanced ToT, refresher and induction training

Faculty Development
Upskilling of Polytechnic and Engineering faculty

Workforce Upskilling
Short-term courses for MSMEs, PSUs, Govt. and Defence

Industry Collaboration
CSR, guest faculty, live projects and apprenticeship

Expected Outcomes

1. Improved quality of ITI and vocational training
2. Regular upskilling of faculty and trainers
3. Advanced skilling of workforce in manufacturing
4. MSME productivity and technology exposure support
5. Skilled manpower for electronics and semiconductor ecosystem
6. Improved apprenticeship, placement and replication model

From existing institutional strengths to a future-ready National Centre of Excellence under PM SETU