

# **Best Practice – I**

## **1. Title of the practice:**

Role of **Centre of Excellence for Electric Vehicle and Related Technologies (CoE for EVRT)** in promoting green transportation in DTU campus.

## **2. Objectives of the practice:**

The objectives of the practice are:

- (1) Design, Development and Analysis of EV motors and drives
- (2) Design, development, and analysis of cost-effective and sustainable EV prototype
- (3) Design and Development of battery packs and BMS for different types of EV
- (4) Design and retro-fitment of existing ICE vehicles to EVs
- (5) Design and Development of EV charging infrastructure and grid management
- (6) To offer M.Tech. and Ph.D. Programs in the area of EV technology
- (7) To offer internship opportunities to students of degree, diploma and certificate level institutions under Government of NCT of Delhi
- (8) Capacity building in terms of trained manpower at different levels such as technicians, supervisors and engineers in the area of EV technology

## **3. The Context:**

Due to rise in the carbon emissions from the conventional vehicles, the electric vehicles (EVs) provide the most promising solutions in curbing the hazardous environmental issues. For the enhancement of knowledge among the researchers and making the students industry-ready in the field of EV, the infrastructure was needed for having hands-on practice in different areas like motor drives, BMS and chargers etc. Thus, the university has constructed a dedicated building of about 3375 sq. ft.- built area, spreading over three floors of CoE for EVRT in Electrical Engineering Department, DTU.

For retro-fitment of existing ICE vehicles, the workshop arena is developed. For the development of collaboration among university with industries, a university level platform was essential for organizing various interactive sessions. Thus, this practice has been designed and implemented in order to address the issue of lack of research platform in EV and related technologies at university level, so that future generations of engineers and faculties are inculcated with the knowledge of EV practices and the state-of-the-art activities in the field of EV related technologies.

## **4. The practice:**

The University has established the Centre of Excellence for Electric Vehicles and Related Technologies (CoE for EVRT) to impart training and research in the thrust area of Electric Vehicles and Related Technologies. The Centre develops an eco-system for transformation from a traditional to an eco-friendly transportation system. A state-of-the-art facility for training of EVs is created to carry out interdisciplinary research on Electric Vehicle and associated areas.

The Centre is jointly funded by Delhi Knowledge Development Foundation, Govt. Of NCT of Delhi and Delhi Technological University (DTU). CoE for EVRT has focused research areas including, but not limited to, design, development, and analysis of electric vehicle motors and drives, charging infrastructure,

charge controllers, retrofitting communication between the power grid and EVs, battery management systems, charging stations, etc.

The Centre will strive to network and collaborate with industries, research laboratories, and other institutions of excellence in India and abroad to conduct cutting-edge research and development in EVs and offer postgraduate programs.

Many faculty members of the Department of Electrical Engineering, DTU, are already working in different areas related to electric vehicle technologies through various sponsored projects. These islands of research endeavors and the expertise of the faculty members involved in them are being gainfully collaborated for the development of CoE for EVRT. In a very short span, the CoE of EVRT has established a strong industry-academia collaboration to achieve the objectives of the Centre.

For research and development activities necessary test equipment have been procured in the centre. Also, adequate technical manpower for research and development activities is engaged and working on different projects in the Centre. The Centre is signing MoUs with leading EV manufacturers/start-ups for the commercialization of EV products through technology agreements.

This Centre not only provides interdisciplinary research and development ecosystems but also offers internships, skills development courses, entrepreneurship programs, and facilitating industrial training for undergraduate students and research scholars.

The Centre is facing following limitations/ challenges:

- Procurement Process being governed by Purchase rules of the University; it is difficult to meet the originally proposed timelines in respect of procurement.
- Non-availability of suitable manpower at all level is also hampering the progress of the projects.
- The exhaustion in management of manpower funds.
- Variation in price with respect to approved items also inhibit the progress.

## **5. Evidence of success:**

### Performance against targets:

- The department organized summer internship on “Electric Vehicles Technology” in AY 2022-23 and AY 2023-24 for students of Diploma and Engineering institutions of Govt. of NCT of Delhi. Eleven students in 2022 and Twelve students in 2023 completed their Eight-Week internship in the Centre.
- The Centre has also organized a One-Day Workshop on “Power Converter Technologies in Electric Vehicle Applications” on 26th December 2023.
- The Centre has introduced Electric Vehicles Technologies for undergraduate (UG) students from January 2024 as a Minor in Electric Vehicle Technology. The academic council in its 36th meeting has approved the minor in Electric vehicle Technology for B.Tech students under CoE for EVRT.
- Seven Ph.D. scholars, five M. Tech. students and seven B. Tech. students are also associated with the Centre.
- Retrofitted e-Golfcart is plying in DTU campus for green transportation facility.
- For promoting green transportation in DTU campus, the proposal of running two more e-Golfcarts is under progress.
- Also, the proposal for running e-cycles is under progress.
- Research and development milestones:
  - Development of Intelligent Battery Management System (BMS)
  - Development of Cost-Effective Battery Management System (BMS)

- Design and Development of Four-Seater Prototype Car Model
- Development of industry sponsored Laboratory, i.e., Green Mobility Research and Fabrication Laboratory, jointly funded by Paytm Pvt. Ltd. and DTU.

➤ Patents:

- Title: Development of e-rickshaw BLDC motor controller
  - Status: Granted
- Title: A high gain Fault Tolerant Multiport DC-DC converter
  - Status: Application in hearing
- Title: Development of Intelligent BMS
  - Status: Under filing stage
- Title: Development of Cost-effective BMS
  - Status: Under filing stage

➤ Collaboration with Industries:

Industry Name	Grant Received (Rs.)
PAYTM Pvt. Ltd.	1.01 Cr

➤ Collaboration with Start-ups:

Many start-ups have been associated with the CoE for EVRT since the beginning, providing modern solutions for the EV related technologies.

- Company: ‘Mazout Electric Pvt. Ltd.’
- Company: ‘MYeKIGAI Pvt. Ltd.’
- Company: ‘SelectricGo EV Solutions Pvt. Ltd.’



**Results:**

These success milestones have been driving forces for gaining further achievements from the ongoing research in the Centre as well as Electrical Engineering Department, DTU.

As a result of this, various universities are collaborating with CoE for EVRT for carrying out various training sessions as well as research in the Centre. Also, procedure of collaboration with few PSUs is also in progress for making the green campus of DTU.

*What do these results indicate?*

These results indicate that there are a lot of research gaps and many productive steps can be taken in upcoming AYs in order to fulfill the stated targets and take necessary steps to achieve them.

**6. Problems encountered and Resources required:**

The Centre is facing few challenges, as given below:

- There is shortage of dedicated staff members in the Centre. Due to this, the progress in research activities is hampered. Also, the funds for manpower is already exhausted. Hence, manpower funds is required.
- The university can provide at least two staff members.
- Funds may be sanctioned for the recruitment of suitable manpower for further development of the Centre.
- The following Equipments are to be purchased:
  - Battery Charge & Discharge Test System
  - Battery simulator with software
  - CAN card
  - Main On-board charger
  - Traction converter and inverter
  - Cell sorting machine and Cell capacity tester
  - Laser welding jig
  - PCB fabrication machine
  - Automatic spot-welding machine
  - 3-D printer
  - Pack capacity tester
  - DC dynamic load
  - Vibration tester
  - PCB design studio
  - Battery Pack Test-set
  - Solid works (Advance License)
  - EV Battery Structure Recognition and BMS Training System
  - CAN Bus Communication Training System
  - EV Accelerator Pedal and Brake Pedal Position Sensor Training System
  - Complete EV Training Demonstrator

# **Best Practice – II**

**1. Title of the Practice:** Vinod Dham Centre of Excellence for Semiconductor and Microelectronics (VDCoE4SM)

**2. Objectives of the Practice:**

- (a) To establish a centralized state of the art infrastructure facility for next generation device design/materials research/fabrication and sustain educational resources for cutting edge Research and Development in Semiconductor and Microelectronics.
- (b) Capacity building in terms of skilled manpower at different levels such as technicians, supervisors and engineers in the area of Semiconductor Technology, IC Manufacturing and Microelectronics.
- (c) Design the curriculum with desired skill sets in research, design, fabrication, equipment manufacturing, packaging, and other related fields for development of Indian semiconductor and display ecosystem.
- (d) To offer internship opportunities to the students of degree, diploma and certificate level institutions at state and national levels under Govt of NCT of Delhi.
- (e) To offer M.Tech and Ph.D. programmes in the area of Semiconductors, IC Manufacturing and Microelectronics.
- (f) Collaboration between Delhi Technological University and Semiconductors/Microelectronics Industry in order to align training & research as per industry needs.

**3. The Context:**

Delhi Technological University has recently established the Vinod Dham Centre of Excellence For Semiconductors and Microelectronics (VDCoE4SM) in May 2023 with a focus on imparting training and research in thrust areas of Semiconductor Technology and IC Manufacturing; and to provide a platform to boost productivity, address emerging skill gaps and align training and research with industry needs. Thus, in order to support the Government's India Semiconductor Mission and create a skilled manpower for Semiconductor Chips and manufacturing industry, the Centre has been established with a vision to stimulate and create a robust R & D ecosystem that drives innovation, IP and start-ups in Semiconductor Technology and Microelectronics to cater to the Nation's scientific demands; and serve as a Centre of National and Strategic importance.

**4. The Practice:** The VDCoE4SM will offer academic programs (minor courses, certificate programme, M.Tech by Research, Ph.D, etc), workshops, and research opportunities, equipping students and professionals with cutting-edge knowledge in semiconductor design, fabrication, and applications. It will serve as a platform for knowledge exchange and will facilitate partnerships with leading global semiconductor firms, enabling exposure to international best practices and technological advancements.

**(a) Uniqueness in the Context of Indian Higher Education**

- Interdisciplinary Approach
- Industry Collaboration
- Skill Development
- Global Standards with Local Relevance

**(b) Present constraints**

- Awareness and Engagement
- Resource Availability
- Funding Challenges

**5. Evidence of Success:** The centre is able to run Minor Specialization in Semiconductors and Microelectronics for B.Tech students and since its start, it has become quite popular among students for which special approval need to be taken to increase the strength of the student. In addition to the successfully running the Minor specialization for B.Tech students, the centre is able to tap the support of EDA Tools from Cadence, Synopsys, Mentor, Ansys for the next 4-5 years under the Chip to Startup Programme, Ministry of Electronics and Information Technology (MeitY), Govt. of India. Under the VDCoE4SM, several workshops and an International Conference on Microelectronics, Circuits and Systems-MICRO 2024 on May 16-17, 2024 in association with Applied Computer Technology, Kolkata has been organised. Several MoU has been signed, including the important one with Semiconductor Laboratory (SCL), Chandigarh on 08 November, 2023 and an International MoU from National Chi Nan University in Taiwan has been finalised.

**6. Problems Encountered and Resources Required:** Although, the centre is actively engaging students, through offering Minor courses, workshops, seminars, industrial visits, conferences, etc, the admission of Ph.D student was not successful and may be due to the lack of awareness about the centre and its domain areas. For this the centre is actively organising various institute level events, as well for wider publicity on social media as well as university website. As the centre is being in the development state, there is very much requirement of infrastructure for the development of packaging labs, Microelectronics Labs, software's and systems. In this direction the space has been finalised and is in the development stage.

## **Vinod Dham Centre of Excellence for Semiconductors and Microelectronics (VDCoE4SM)**

### **INTRODUCTION**

Delhi Technological University has recently established the Vinod Dham Centre of Excellence For Semiconductors and Microelectronics (VDCoE4SM) in May 2023 with a focus on imparting training & research in thrust areas of Semiconductor Technology and IC Manufacturing; and to provide a platform to boost productivity, address emerging skill gaps and align training & research with industry needs. Thus, in order to support the Government's India Semiconductor Mission and create a skilled manpower for Semiconductor Chips and manufacturing industry, the Centre has been established with a vision to stimulate and create a robust R & D ecosystem that drives innovation, IP and start-ups in Semiconductor Technology and Microelectronics to cater to the Nation's scientific demands; and serve as a Centre of National and Strategic importance.

### **VISION OF THE CENTRE**

To stimulate and create a robust R & D ecosystem that drives innovation, IP and start-ups in Semiconductor Technology and Microelectronics to cater to the Nation's scientific demands; and serve as a Centre of National and Strategic importance.

### **MISSION OF THE CENTRE**

1. To be a trusted technology and capacity provider of the global Semiconductor and Microelectronics industry with a sustainable impact through innovative semiconductor technologies and solutions.
2. To create environment of research, collaboration, innovation and skill development bridging the gap between academia and industry.
3. To provide ethics and value-based education by promoting activities addressing the societal needs.
4. To enable students develop skills to solve complex technological problems of current times and create world class professionals competent enough in the area of Semiconductors and Microelectronics.

### **OBJECTIVES:**

1. To establish a centralized state of the art infrastructure facility for next generation device design/materials research/fabrication and sustain educational resources for cutting edge Research and Development in Semiconductor and Microelectronics.
2. Capacity building in terms of skilled manpower at different levels such as technicians, supervisors and engineers in the area of Semiconductor Technology, IC Manufacturing and Microelectronics.
3. Design the curriculum with desired skill sets in research, design, fabrication, equipment manufacturing, packaging, and other related fields for development of Indian semiconductor and display ecosystem.
4. To offer internship opportunities to the students of degree, diploma and certificate level institutions at state and national levels under Govt of NCT of Delhi.

5. To offer M.Tech and Ph.D. programmes in the area of Semiconductors, IC Manufacturing and Microelectronics.
6. Collaboration between Delhi Technological University and Semiconductors/Microelectronics Industry in order to align training & research as per industry needs.

**ACTIVITIES UNDER THE VINOD DHAM CENTRE OF EXCELLENCE FOR SEMICONDUCTORS AND MICROELECTRONICS (VDCoE4SM)**

- The Centre has already introduced a Minor specialization in Semiconductors and Microelectronics for B.Tech students, in order to enhance the semiconductor manufacturing skills and increase the spectrum of students pursuing course in Semiconductors so as to build a strong semiconductor ecosystem. Moreover, these students in the final semester will undergo hands-on training at IC Manufacturing/Semiconductor based Labs/Industries in order to develop a strong workforce in nano-fabrication in India over the next 10 years.
- In addition, Ph.D programme in Semiconductors and Microelectronics has also been introduced under the Centre so as to align the research opportunities with the industry requirements.
- The Centre has started fostering collaborations by signing Memorandum of Understanding (MoU) with various industries and labs as well as with esteemed universities.
- The Centre has already signed an MoU with the Semiconductor Laboratory (SCL), Chandigarh which is India's only integrated device manufacturing facility.
- An International MoU from National Chi Nan University in Taiwan has also been received for finalization.
- Further, collaborations with ESSCI, IESA, Applied Materials and VLSI Society of India are already in process.
- We, through the Centre, has also recently submitted a proposal under the Chip to Startup Programme, Ministry of Electronics and Information Technology (MeitY), Govt. of India and DTU has been selected for extending the support of EDA Tools from Cadence, Synopsys, Mentor, Ansys for the next 4-5 years.
- Establishment of Microelectronics System Design Laboratory under the Centre is almost done in the new space allotted to the Centre.
- The Centre is also in process of having a consortium of institutes/universities such as IIT Delhi, IIT Mandi, IIT Ropar etc. so as to have an exchange of expertise between the universities for future research and skill upgradation. This would maximise the utilization of high end resources available at these places.



- The Centre is also quite active in organizing events, workshops, seminars, conferences etc. centred on semiconductors and microelectronics to build awareness of semiconductor career paths, sessions related to the chip industry and including the buzzword of semiconductors.
- The Centre is organizing a 2-day International Conference of Microelectronics, Circuits and Systems-MICRO 2024 on May 16-17, 2024 which is also being supported by IEEE EDS Delhi Chapter.
- This centre plans to identify and investigate the perennial problems of Industries/Micro Small and Medium Enterprises (MSME) in the semiconductor devices and will provide the feasible solutions.
- The Centre would also work for skill development, startups, exploration of new ideas, bridging the gap between industry and academia and training and education. This collaboration will be a great platform for mutual benefit for the academia as well as the industries high value industrial problems to provide the cutting edge research-based solutions.

#### **CORE TEAM OF THE CENTRE:**

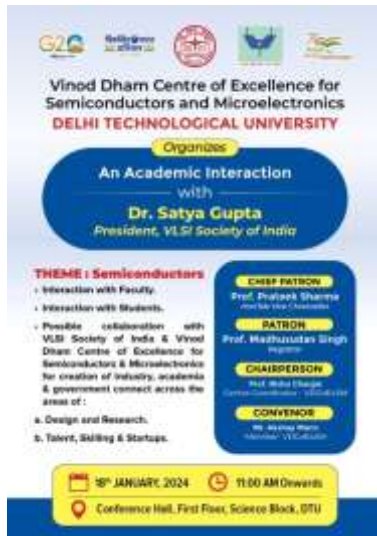
- |    |                                  |                      |
|----|----------------------------------|----------------------|
| 1. | Prof. Rishu Chaujar, Dept. of AP | : Centre Coordinator |
| 2. | Prof. Neeta Pandey, Dept. of ECE | : Member             |
| 3. | Dr. Deva Nand, Dept. of ECE      | : Member             |
| 4. | Dr. M.S. Mehata, Dept. of AP     | : Member             |
| 5. | Dr. Bharti Singh, Dept. of AP    | : Member             |
| 6. | Dr. Mukhtiyar Singh, Dept. of AP | : Member             |
| 7. | Dr. Sumit Kale, Dept. of ECE     | : Member             |
| 8. | Mr. Akshay Mann, Dept. of ECE    | : Member             |

#### **EVENTS ORGANIZED UNDER THE VINOD DHAM CENTRE OF EXCELLENCE FOR SEMICONDUCTORS AND MICROELECTRONICS (VDCoE4SM)**

1. One Day Workshop on Atomistic Modeling using Synopsys Quantum ATK for Nanomaterials/Nano Devices held on January 11, 2024 in Pragyan Hall, DTU.



- An Academic Interaction with Dr. Satya Gupta, President VLSI Society Of India on the Theme: Semiconductors held on January 18, 2024 in Conference Hall, Science Block, DTU.



**Vinod Dham Centre of Excellence for Semiconductors and Microelectronics**  
**DELHI TECHNOLOGICAL UNIVERSITY**

Organizes  
**An Academic Interaction**  
 with  
**Dr. Satya Gupta**  
 President, VLSI Society of India

**THEME : Semiconductors**

- Interaction with Faculty.
- Interaction with Students.
- Possible collaboration with VLSI Society of India & Vinod Dham Centre of Excellence for Semiconductors & Microelectronics for creation of industry, academia & government connect across the areas of :
  - Design and Research.
  - Talent, Skillng & Startups.

**CHIEF PATRON**  
 Prof. Pradeep Sharma  
 Vice-Chancellor

**PATRON**  
 Prof. Mahasweta Singh  
 Pro-VC

**CHAIRPERSON**  
 Prof. Raju Chaudhary  
 Director, VLSI Center

**CONVENOR**  
 Mr. Anshu Malik  
 Member, VLSI Center

18<sup>th</sup> JANUARY, 2024 11:00 AM onwards  
 Conference Hall, First Floor, Science Block, DTU



- An Industrial Interaction with Mr. MG Hwang-VP and GM, Silvaco, Asia and Mr. Zhao Qingda, MD, Silvaco, Singapore held on January 23, 2024 in Conference Hall, Science Block, DTU.



**Vinod Dham Centre of Excellence for Semiconductors and Microelectronics (VCoE4SM)**  
**DELHI TECHNOLOGICAL UNIVERSITY**

Organizes  
**An Industrial Interaction**  
 with  
**Mr. MG Hwang** (VP & GM, Silvaco, Asia) and **Mr. Zhao Qingda** (MD, Silvaco, Singapore)

**Key Highlights :**

- Interaction with Faculty.
- MOU between Vinod Dham Centre of Excellence for Semiconductors & Microelectronics & Silvaco.
- Collaboration in Teaching, Research & Development.
- Cooperation in Projects, Research & Consultancy Activities.
- Exchange of Students for Summer/Winter Internships.
- Publication of Intellectual Properties (IPs).
- Cooperation in Curriculum Development.

**CHIEF PATRON**  
 Prof. Pradeep Sharma  
 Vice-Chancellor

**PATRON**  
 Prof. Mahasweta Singh  
 Pro-VC

**CHAIRPERSON**  
 Prof. Raju Chaudhary  
 Director, VLSI Center

23<sup>rd</sup> January 2024 11:00 AM  
 Conference Hall, First Floor, Science Block, DTU







GOVERNMENT OF NCT OF DELHI  
DELHI KNOWLEDGE DEVELOPMENT FOUNDATION

(Society registered under Societies Registration Act of 1860)

(Registration No. 5/61569/2008)

ROOM NO:-7, Board of Technical Education: MUNI MAYA RAM MARG, PITAMPURA, DELHI-110068

e-mail: ms.dkdf@gmail.com

F.No. DTU/EED/CVERT/14/2020/1080

Dated: 29/01/2021

To,

✓ Vice Chancellor (DTU),  
Shahbad Daulatpur, Main Bawana Road,  
Delhi - 110042

copy to Registrar

HOD/E.E

Subject: Proposal for Centre for Electric Vehicles and related technologies in DTU.

Dear Sir,

Dean (EED)

Your proposal to establish Centre for Electric Vehicles and related technologies in DTU. With an expenditure of Rs.9,57,00,000/- to be released in two phases of Rs. 6.58 crore and Rs 2.99 crore approved by the 18<sup>th</sup> Executive Committee of Delhi Knowledge Development Foundation (DKDF) held on dated 03/11/2020 at 03.00 PM by online through Webex under the Chairmanship of Sh. H Rajesh Prasad, Pr. Secretary (TTE) / President (DKDF).

I am directed to convey the approval of 18<sup>th</sup> Executive Committee meeting of DKDF for the same. You are requested to ensure the following:

- Each center of excellence will be monitored in-house on a regular basis but at least once in a month by Vice Chancellor / Director of the concerned institute.
- Performance review of the Centers will be carried out once in six months by a team to be constituted by President DKDF / Pr. Secretary (TTE).
- Centers of Excellence should offer internship in addition to its own students and to the students of Universities / Colleges / Polytechnics / ITI's under the Department of Training and Technical Education.
- Observation of all codal formalities.
- Observation of instructions issued by Finance Department GNCTD/CVC/DTTE from time to time.

In view of the above you are requested to send a panel of 6-8 experts to be approved by Pr. Secretary (TTE)/President (DKDF) for performance review of Centre for Electric Vehicles and related technologies in DTU.

Thanking you

F.No. DTU/EED/CVERT/14/2020/1080

Copy to:-

1. P.S. to Pr. Secretary (TTE)/President (DKDF), Delhi.
2. P.S. to Director (TTE), Delhi.
3. P.S. to Joint Director (TTE)
4. DCA (TTE)/Treasurer (DKDF)
5. Prof. Madhusudan Singh, Project Coordinator, DTU
6. Guard File

(Ashwani Kumar Kansal)  
MEMBER SECRETARY (DKDF)

Dated: 29/01/2021

(Ashwani Kumar Kansal)  
MEMBER SECRETARY (DKDF)

**MEMORANDUM OF UNDERSTANDING**

**BETWEEN**



**SEMI-CONDUCTOR LABORATORY  
MINISTRY OF ELECTRONICS & INFORMATION TECHNOLOGY  
(MeitY), GOVERNMENT OF INDIA**

**S.A.S. NAGAR, PUNJAB**

**AND**

**DELHI TECHNOLOGICAL UNIVERSITY,  
BAWANA ROAD, DELHI**

**COLLABORATION ON RESEARCH AND DEVELOPMENT,  
FACULTY AND STUDENT EXCHANGE**

## MEMORANDUM OF UNDERSTANDING

In furtherance of their mutual interest in the fields of education and research and as a contribution towards increasing international cooperation, Semi-Conductor Laboratory, Ministry of Electronics & Information Technology (MeitY), Government of India, having its registered address at Sector 72, S.A.S. Nagar - 160071, Punjab, India (hereinafter referred to as SCL) and Delhi Technological University (DTU), Bawana Road, Delhi-110042, India (hereinafter referred to as DTU) have entered into this Memorandum of Understanding (MOU) on 08.....day of ..November, 2023 as set forth below:

### ARTICLE I

The MOU involves collaboration between SCL and DTU (both also referred to as institution) in related disciplines.

The two institutions shall seek to promote:

1. Exchange of Staff and Students (Faculty & Research Scholars; Under Graduate, Post Graduate & Doctoral Students and Research Project Employees) regarding Academics and Research for the mutual benefit of both institutions.
2. Exchange of Students for pursuing Courses of Study and Academic Programmes for mutual benefit of both institutions.
3. Collaboration in Teaching, Research & Development and Consultancy Activities.
4. Exchange of Academic & Research Material and Publications/IPs.
5. Cooperation in Projects and Research Activities of mutual interest.
6. Provision of Cultural and Intellectual enrichment opportunities for the Staff and Students of both institutions.
7. Collaboration in Research & Development in the areas of (i) Advanced VLSI Device Fabrication (ii) MEMS Fabrication, (iii) VLSI Device/ MEMS Characterization, (iv) VLSI/CMOS-RF Circuit Design and (v) VLSI Device Modeling at both DTU and SCL. This also includes collaboration in setting-up and upkeep of the relevant infrastructure in both the institutions.
8. Publication of Research Papers in International Scientific Journals and in the Conferences.
9. Exchange of Students for Summer/Winter Internships
10. Publication of Intellectual Properties (IPs) developed jointly through Project/ Research Collaboration. Such IPs would acknowledge joint inventor-ship of Personnel/Students belonging to both the institutions, as applicable and the benefits/profits generated will be shared mutually on equal basis.

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11. Publishing and Writing Books/Booklets jointly in the areas of mutual interest & benefits accrued will be shared mutually on equal basis.

## ARTICLE II

The activities under this MOU will include:

### 1. Staff Exchange

Staff Exchange activities cover visits to either institution for any of the following purposes:

- (i) Undertaking Joint Research on mutual sharing basis.
- (ii) Attachment of Staff for purposes of Curriculum Development & Review, Attendance in Courses and Upgrading of Teaching & Research Skills on mutually agreed terms & conditions.
- (iii) Participation in Seminars, Colloquia and other types of academic discussions
- (iv) Contributions to Teaching Programmes
- (v) Co-supervision of Post Graduate Students on mutually agreed terms & conditions.
- (vi) Conduct study tours, joint consultancy and research work
- (vii) Facilitation for pursuing Academic Courses (Post Graduate & Doctoral) for Ministry of Electronics & Information Technology (MeitY), / SCL Employees at DTU on mutually agreed terms & conditions.

### 2. Student Exchange:

Student Exchange activities (for Under Graduate, Post Graduate & Doctoral Students) cover visits to either institution for any of the following purposes:

- (i) Participation in Research
- (ii) Internships for DTU Students at SCL

### 3. Exchange of Academic Materials:

Exchange of relevant Academic Materials will be carried-out subject to mutual agreement of both institutions.

## ARTICLE III

Implementation of cooperation based on this MOU shall be dealt with between the relevant Faculties and Divisions/ Departments of both institutions. Wherever necessary, a specific plan shall be worked-out for each activity setting-forth detailed arrangements for collaboration. Such plans shall be subject to approval of the appropriate authorities of each institution. To facilitate development of such plans, each institution shall nominate a member of its staff to coordinate activities arising under this MOU.



#### ARTICLE IV

Both institutions agree and undertake to keep confidential at all times information and/or data that may be exchanged, acquired and/or shared in connection with the area of cooperation, as mentioned above, unless otherwise the same information already exists in the public domain. The Parties will not use the information for the purpose other than that specified without the prior written consent of the other Party.

#### ARTICLE V

Ownership of findings of any joint research shall be vested in both institutions under this MOU and any publications regarding the same shall only be possible after prior approval from both institutions. The use of the name, logo and/or official emblem of the Parties on any publication, document and/or paper will require prior permission of both the Parties. It may, however, be ensured that the official emblem and logo is not misused.

Should the activities under the MOU give rise to Intellectual Property (IP), the Parties shall enter into separate agreement that will specifically provide for ownership, management and commercialization of rights to such IP, in line with rules and regulations of India.

#### ARTICLE VI

In case of any dispute or difference of opinion arises between the parties connected to this MOU/agreement, such disputes or difference of opinion shall be resolved amicably by mutual consultation in consonance with the public policy of the Ministry of Electronics & Information Technology (MeitY).

#### ARTICLE VII

This MOU shall remain in force for a period of 10 years from the date of signing and may by way of amendment be renewed with the three-month prior notice to other party for such period and on such terms and conditions as agreed by the parties. However, either party has right to terminate this MoU by serving 03 (three) months prior reasoned notice in writing to other party.

#### ARTICLE VIII

Both the SCL and DTU reserve the right to terminate this MOU by either institution giving 3 (Three) months written notice to the other. Where such termination occurs, the provisions of this MOU shall continue to apply to ongoing activities until their completion.

#### ARTICLE IX

The provisions of this MoU shall be governed by the Laws including Law of Contract in consonance with the rules & regulation applicable to the parties.

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ARTICLE X

SCL and DTU welcome establishment of this MOU for cooperation and jointly agree to provisions as set out above. There are two copies of this MOU equally valid, one for each institution, effective after its signing by authorized signatories.

IN WITNESS WHERE OF, the Parties hereto have caused this MoU to be signed in their respective names on this 08 day of NOV, 2023...

Semi-Conductor Laboratory

250 8/11/23

सुधीर ठाकुर/ SUDHIR THAKUR  
समूह प्रमुख-पी.पी.जी./ Group Head-PPG  
सेमी-कंडक्टर लैबोरेटरी/ Semi-Conductor Laboratory  
इलेक्ट्रॉनिक्स और सूचना प्रौद्योगिकी मंत्रालय  
Ministry of Electronics & Information Technology  
भारत सरकार/ Government of India  
सेक्टर-72, सा.अ.सि. नगर/ Sector-72, S.A.S. Nagar  
मोहाली-160071 (पंजाब) Mohali-160071, Punjab

Witness Shilpa Midua

Date: 08-11-23

Delhi Technological University

PR. DE. MADHUSUDAN  
SINGH  
Registrar  
Delhi Technological University  
(Formerly Delhi College of Engineering)  
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