School of Integrated Learning and Research

Delhi Technological University

(Formerly Delhi College of Engineering)

Shahbad Daulatpur, Main Bawana Road, Delhi-42

Message from the Dean

I extend my warmest greetings to all on behalf of the School of Integrated Learning and Research (SILR) at Delhi Technological University (DTU). SILR is a testament to our university's unwavering commitment to academic excellence, integrated learning, interdisciplinary research, and innovation-driven learning.

In alignment with the vision and mission of DTU and the transformative objectives of the National Education Policy (NEP) 2020, SILR stands as an initiative aimed at fostering the convergence of diverse disciplines. Our goal is to unify traditional academic domains and nurture a holistic learning ecosystem that integrates technological advancements, scientific exploration, and the rich ancient knowledge of India. Through this integration, we aim to address emerging global challenges, drive innovation, and empower our students with the skills and insights needed to thrive in a rapidly evolving world.

SILR is designed to be a dynamic academic and research hub that encourages collaboration across various domains, including Artificial Intelligence, Data Analytics, Environmental Science, Digital Healthcare, Community Development, Energy Transition, Geospatial Technologies, Climatic Action, and Indian Knowledge Systems. Our state-of-the-art research centers, interdisciplinary academic programs, and industry partnerships will ensure that our students and faculty engage in meaningful research that has both national and global impact.

As we move forward, SILR will play a pivotal role in developing cutting-edge undergraduate, postgraduate, and doctoral programs that promote multi-disciplinary and cross-disciplinary approaches. By fostering strong linkages with industries, research organizations, and academic institutions worldwide, we aspire to cultivate an environment where students and researchers can innovate, create, and contribute to the advancement of knowledge and societal progress.

I invite students, researchers, academicians, and industry experts to be part of this transformative journey. Together, let us build a future where integrated learning and research pave the way for sustainable solutions, technological advancements, and an enlightened society.

Prof. A. Trivedi
Dean, School of Integrated Learning and Research (SILR)
Delhi Technological University

About the School

The School of Integrated Learning and Research (SILR) at Delhi Technological University (DTU) has been constituted in consonance with the university's vision and mission. The purpose of the SILR is to integrate interdisciplinary, multidisciplinary, and crossdisciplinarity practices, inclusive of the ancient knowledge of India with the university's educational objectives and NEP 2020. This school shall be the backbone of integrated research at the university and the formative ground for the development of futuristic scientific fields relevant to evolving societal challenges.

The school has been founded to advance the concept of scientific convergence, uniting diverse disciplines and fostering deep cross-fertilization of knowledge across the university. The school aspires to pioneer groundbreaking scientific research with a unified mission to tackle emerging national and global challenges. To promote academic and research integration, the school aims convergence of several departments and centres of excellence, dissolving conventional disciplinary barriers and promoting the development of new disciplines. The school aims to develop multiple departments offering undergraduate courses in various domains, such as artificial intelligence integrated science, engineering, digital education, universal healthcare, and other emergent areas. The school shall conduct research in emergent areas of their respective specializations. The specialized departments shall guide and supplement the curriculum, teaching-learning methodologies, and associated activities of the departments under the SILR. Housing SILR would complete the academic, entrepreneurship and applied research ecosystem, enabling the dissemination of knowledge created through research parks and centres of excellence through formal educational programs. The school aims to be a seat of learning that creates an environment that facilitates the establishment of linkages among concepts and experiences to apply the information and skills to address novel and complex issues or challenges. The school will house a set of centres or departments, and these centres will run various programs and courses.

In addition, there will be research activities and tie-ups with leading national and international organizations to strengthen multiple areas in the respective dimensions. It is also expected to disseminate knowledge and activities in various interdisciplinary areas.

This initiative aims to create a vertical in the environment that encourages innovation, creative micro credentials, and holistic education by dismantling conventional academic boundaries by integrated learning and research, as shown in Figs. 1 and 2.

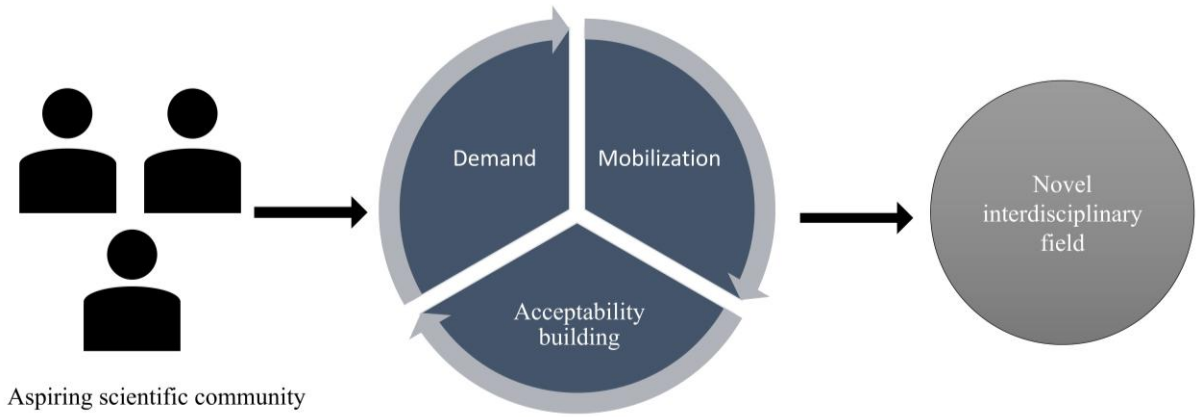

Figure 1: Flow chart to evolve interdisciplinary field aspired by scientific community with demand, mobilization, and acceptability building

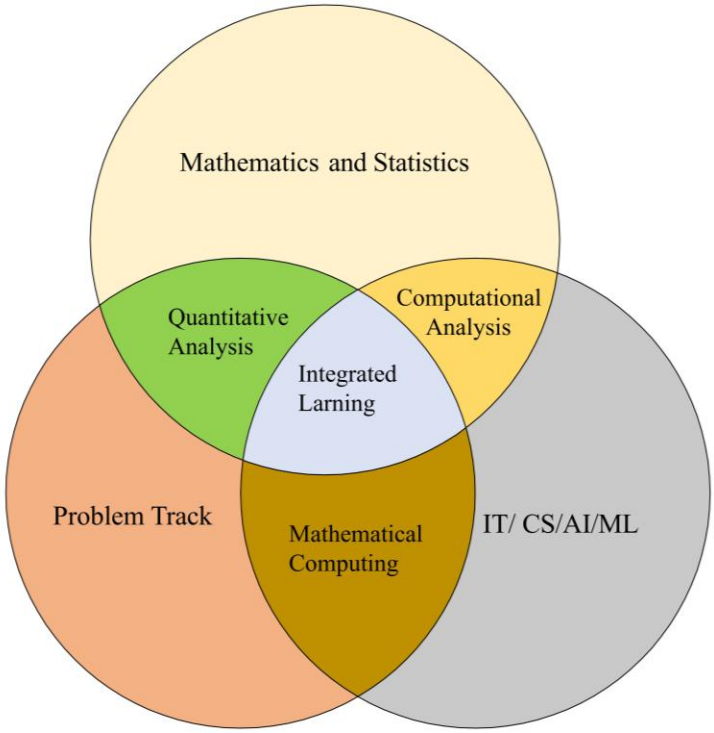

Figure 2: Flow chart to evolve interdisciplinary field aspired by scientific community with demand, mobilization, and acceptability building

Vision and Mission

Vision

- To establish a leading centre for integral education to fosters interdisciplinary and multidisciplinary

learning.

- To nurture technologically adept researchers through a globally benchmarked curriculum within a dynamic, integrated learning environment.
- Creation of new knowledge, innovations, and credentials supported by a highly qualified and inspired faculty, while maintaining strong collaborations with industry and R&D organizations.

Mission

- To integrate a variety of academic disciplines into a cohesive learning program,
- To establish centres to interlink and integrate the Indian knowledge system with existing mono-disciplinary departments of DTU,
- To establish an inclusive educational environment for students from all backgrounds,
- To foster innovation in interdisciplinary and multidisciplinary collaborative research, and
- To present students with the necessary skills to navigate the complexity of the modern world.

Background and Needs

The implementation of the National Education Policy (NEP) 2020 represents a substantial transition in the nation's educational environment. It percolates through a multidisciplinary, adaptable, and comprehensive educational approach that prepares students for the intricacies of the contemporary world and addresses their diverse requirements. It supports the dismantling of conventional educational divisions, the promotion of inclusive learning, and the cultivation of innovation through interdisciplinary studies. Delhi Technological University, a premier institution known for its academic excellence and innovative research, is committed to aligning with the goals set forth by NEP 2020. In this context, DTU recognizes the need to establish a dedicated School of Integrated Learning and Research (SILR) to cultivate an academic environment that encourages the integration of diverse disciplines, adopts collaborative research, and ensures inclusive education for all. This SILR aims to address the following critical issues:

- Complex global challenges to health and the environment,
- Inspiring creativity and innovation,
- Skill development and employability,
- Development of inclusive education,
- Alignment with NEP 2020,

- Creating a dynamic academic environment, and
- Expanding entrepreneurial research opportunities.

Scope and Objectives

As per the vision and mission of the university and SILR, the scope and objectives of the school are as follows:

Scope

- To provide comprehensive academic programs by integrating a variety of disciplines,
- To ensure students can select courses from various departments depending upon their interests,
- To establish research centres that prioritize addressing real-world problems through interdisciplinary approaches, and
- Design a curriculum to combine technical knowledge with social sciences, humanities, and arts.

Objectives:

- To start departments, centres, and laboratories in the state-of-the-art and emerging areas,
- To initiate collaborative research projects with various national and international institutions,
- To start exploring the possibility of new programs in emerging areas, and
- To offer a large basket of courses and multiple options for minor specializations minor specializations.

Hierarchy of SILR

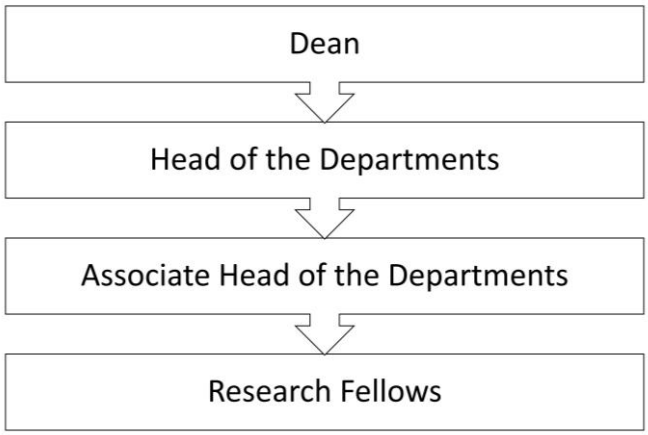

Figure 3: Flow diagram depicting hierarchy of SILR

Academic Structure of the Departments, Centres, and Laboratories

The academic structure of the departments, centres, and laboratories within SILR would consist of the following structure:

- Selected faculty from the core departments (based on research alignment with areas of SILR),
- Associate faculty,
- Adjunct faculty,
- Distinguished faculty in residence, and
- Professors of practice

Departments, Centres, and Laboratories within SILR (UG, PG, PhD)

SILR is set to host a set of departments and centres as follows:

- Departments of AI and Data Analytics
- Department of Environment Science and Engineering
- Centre for Medical Diagnostics and Digital Healthcare
- Centre for Community Development and Research
- Centre of Excellence in Energy Transition
- Centre of Excellence in Geospatial Technologies
- Centre of Excellence for Climatic Action and Sustainability Studies
- Centre of Excellence for Indian Knowledge Systems and Sanskrit Studies

Furthermore, Fig. 2 represents a structured framework for utilizing academic and industrial resources to address engineering challenges and develop specialised expertise. It begins with various sources of resources, including the Training & Placement (T&P) Cell, workshops and conferences, the Dean of Undergraduate/Postgraduate programs, and industry collaborations. Among these, industry resources directly contribute to a "Problem Track," where real-world challenges are identified and addressed. The process then leads to an "Output" stage, signifying solutions or innovations generated from these efforts. Following this, the disciplinary track categorizes the output into specific engineering domains, including Electrical Engineering (N1), Mechanical Engineering (N2), Civil Engineering (N3), and Artificial Intelligence (N4). This structured approach ensures that knowledge and problem-solving

capabilities are effectively utilized to advance different engineering fields.

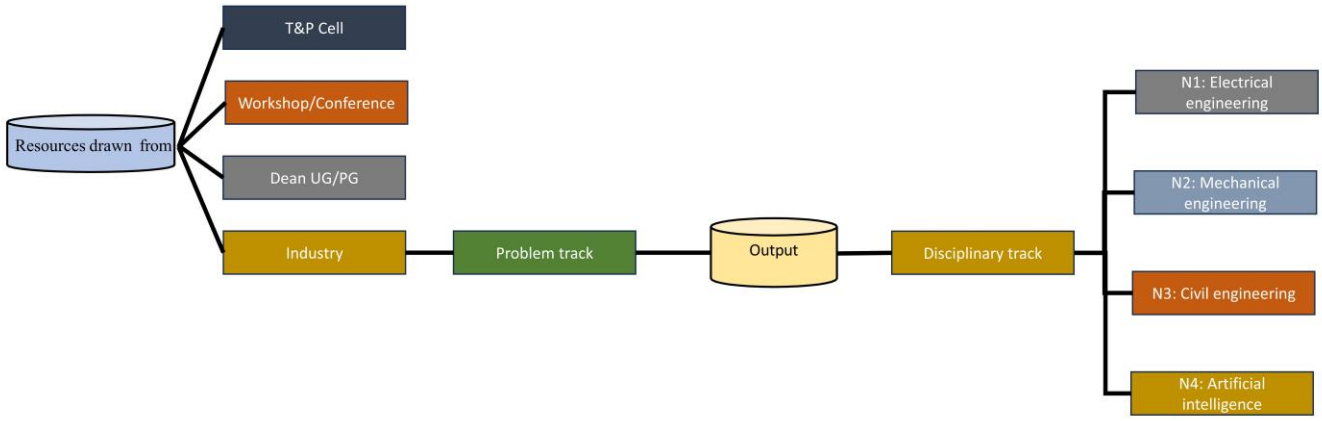

Figure 4: Flow of Resources from Industry and Academia to Problem-Solving and Disciplinary Tracks in Engineering and AI

Academic Programmes

- To start the BTech, MTech, and PhD in integrated domain, which shall be inter-disciplinary, multi-disciplinary, and cross-disciplinary in nature
- To engage in various state-of-the-art emerging areas of learning and research

Collaborative Research Projects

- Inclusive Education Research Initiative
- Innovation and Entrepreneurship Hub
- Interdisciplinary Research Grants
- Industry-Academia Partnerships
- Global Research Collaborations
- Collaborations with IIF
- Research Park at Narela Campus
- Community Development