

# Empowering Higher Education Enabling the future workforce

Offering Industry Integration with UG Programs of Higher education institutions to develop industry ready talent pool.



**INDUSTRY INTEGRATED PROGRAM**



The world of engineering is in the midst of a profound transformation, characterized by advancements in technology and new age applications. In the swiftly evolving realm of engineering, traditional educational approaches often struggle to keep pace with the dynamic demands of the industry. Graduates frequently encounter a disparity between the theoretical understanding gained in classrooms and the practical expertise needed for real-world engineering challenges. This discrepancy impedes their seamless transition into professional roles, leaving them less than adequately prepared to tackle the complexities of contemporary engineering practices.

L&T EduTech is at the forefront of revolutionizing higher education, driven by a vision to equip students with the skills and knowledge needed to excel in the ever-evolving world of engineering and technology.

To meet the demands of a rapidly advancing industry, L&T EduTech has developed specialization programs blended with both technical and life skills, that are to be offered as Industry Integrated Programs by Universities and Colleges.



## Industry Integrated Programs

Recognizing the demand – supply need in every industry sectors, L&T EduTech has developed a concept of Integrated Programs that can be offered by Institutions. These programs represent a paradigm shift in engineering education, offering a holistic approach that seamlessly integrates theoretical learning with hands-on experiences.

By combining cutting-edge curriculum with practical application, students are not only equipped with deep technical knowledge but also gain the crucial problem-solving skills demanded by the industry. This innovative approach ensures that graduates emerge as industry-ready professionals, poised to make meaningful contributions in their chosen fields of engineering.



## Why Integrated Programs?

In today's dynamic engineering landscape, theoretical knowledge alone is no longer sufficient. Integrated Programs at L&T EduTech offer a unique blend of theoretical learning, hands-on experience, and industry exposure. This innovative approach ensures that graduates not only possess deep technical knowledge but also the practical skills and adaptability demanded by the modern workplace.

By integrating real-world projects, cutting-edge technologies, and industry insights, we bridge the gap between academia and industry, producing engineers who are not only proficient in their respective fields but also equipped to drive innovation and lead in a competitive global market.



# BENEFITS FOR INSTITUTIONS

1

Industry  
Integrated  
Programs

2

Enriched  
Curriculum  
and Content

3

Strengthened  
Industry  
Collaboration

4

Diverse  
Learning  
Ecosystem

8

Realtime  
Industry  
Experience

7

Innovative  
Teaching  
Methods

6

Enhanced  
Placement  
Opportunities

5

Thought  
Leadership



# BENEFITS FOR STUDENTS

1

Mastery of  
Industry-specific  
technical skills

2

Enhanced  
behavioral &  
functional skills

3

Stronger  
industry relevant  
knowledge & skills

4

Exposure to  
real world  
industry projects  
& methods

5

Learn from  
industry experts  
and practitioners

6

Earn an Industry  
Specialization from  
the industry leader

7

In-Depth knowledge  
in specialized  
engineering domains

8

Proficiency in  
cutting-edge  
technologies  
and tools



# List of Industry-Integrated Programs for B.E./B.Tech

## Mechanical Engineering

1. Digital and AI Solutions for Oil & Gas and Process Plants
2. Digital Manufacturing using AI and CPS
3. Advanced Power Generation Systems

## Civil Engineering

1. Multi Modal transportation Infrastructure with AI/ML
2. Integrated Building System Design using AI/ML
3. Digital Solutions for Industrial Building Design
4. Digital Transformation in Construction
5. Sustainability Practices in Construction
6. Structural System Design

## Electrical and Electronics Engineering

1. Smart and Sustainable Power Engineering with AI Integration
2. Electrical Infrastructure for Smart Buildings and EV Charging
3. Microelectronics for Electric Vehicles
4. Industrial IoT and Smart Systems

## Electronics & Communication Engineering

1. Semiconductor Design Framework for Industrial ICs
2. Industrial IoT and Smart Systems

## Chemical Engineering

1. Chemical Engineering with Digital Analysis and AI Solutions

## Safety Engineering

1. Practical Applications in Health and Safety Engineering

## Electric Vehicle Engineering

1. Advanced Specialization in Electric Vehicles for EEE/ECE/E&I/Mechatronics Branches
2. Advanced Specialization in Electric Vehicles for Mechanical/Mechatronics/Chemical/Aeronautical Branches
3. Advanced Specialization in Electric Vehicles for CSE/IT Branches

## IT / Computer Science Engineering

1. Agile Methodology with Cloud and DevOps
2. Data Engineering Tools
3. Full Stack Web Development
4. Data Analytics
5. Business Analytics
6. Cyber Security
7. Full Stack MEAN / MERN
8. AI Techniques & ML Algorithms
9. Applied Data Science With Python
10. Data-Driven Product Engineering

# ELECTRONICS & COMMUNICATION ENGINEERING



# Semiconductor Design Framework for Industrial ICs

## Integration with BE / B.Tech: ECE & CSE

Various Sectors like Automotive, Energy, Telecommunication, Consumer Electronics, Edge AI etc. are drifting with Smart sensors, RF Products, SoC's etc. This Paradigm shift creates smart, efficient, and market leading Integrated circuits demand. Future Engineering employability scope is centered around such Integrated circuits. This stack on Semiconductor Design Framework for Industrial ICs aims to offer IC related knowledge and skill for graduates to equip them with abilities of IC Design, IC Fabrication and IC Testing. Specifically, the ASIC and SoC based Design, Fabrication and Testing will be demonstrated with relevant industry practicing exercises and use-cases.

### Recommended Integrated Courses

| Course Name                                                | Category                            | Credits | Semester |
|------------------------------------------------------------|-------------------------------------|---------|----------|
| IT World Essentials: Your Digital Entrypoint*              | Functional Skills                   | 3       | I        |
| Product Design Thinking Framework                          | Functional Skills/ Technical Skills | 3       | II       |
| Embedded Computing Principles                              | Technical Skills                    | 3       | III      |
| Product Architecture Models and Firmware                   | Technical Skills                    | 3       | IV       |
| VLSI Principles, RTL Design and Verification               | Technical Skills                    | 3       | V        |
| Logic Synthesis, DFT and Chip Timing Analysis              | Technical Skills                    | 3       | V        |
| Physical Design and Graphic Design System                  | Technical Skills                    | 3       | VI       |
| Career Readiness in Digital Era*                           | Behavioral Skills                   | 3       | VI       |
| SoCs Design Principles for Industrial Automation Practices | Technical Skills                    | 3       | VII      |
| Foundry Process of IC Manufacturing                        | Technical Skills                    | 3       | VIII     |
| Total Credits                                              |                                     | 30      |          |

#### Mode of Delivery:

Self-paced learning + Expert session (VILT) – 30 hours, Project work – 15 hours

\* Face-to-face instructor led sessions / VILT sessions (including project work)

– 45 hours



# Semiconductor Design Framework for Industrial ICs

Integration with BE / B.Tech: ECE & CSE

## Job Roles

- ▶ Physical Design Engineer
- ▶ EDA Validation Engineer
- ▶ VLSI Engineer
- ▶ VLSI Programmer
- ▶ IC Testing Engineer
- ▶ DFT Engineer
- ▶ RTL Design Engineer
- ▶ Embedded Engineer
- ▶ IoT Engineer
- ▶ Verification Engineer
- ▶ ASIC Design Engineer
- ▶ Layout Engineer
- ▶ FPGA Design Engineer

## Skills

- ▶ **Design:** System, Schematic and Layout
- ▶ **Testing:** Code, STA and CDC
- ▶ **Programming:** C, Embedded C, Python, Micropython, HDL, Vlog, Tcl and System Verilog
- ▶ **Interfacing:** Linux and API

## Software Tools

### Software :

- ▶ Xilinx ▶ Vivado ▶ IDE (Arduino , Thonny) ▶ Cisco Packet Tracer ▶ KiCAD - NgSpice ▶ iverilog
- ▶ coco TB QFlow ▶ Open Lane ▶ Cadence

### Hardware :

- ▶ Xilinx -> Artix Edge 7 ▶ Xilinx -> PYNQ Z2

## Potential Recruiters



# Industrial IoT and Smart Systems

## Integration with B.E. / B.Tech.: ECE, EEE, E&I

The Industrial IoT and Smart Systems stack of course is meticulously designed for Electronics and Communication Engineering students, offering an in-depth design and development skills required for Information and Communication Technology (ICT). This comprehensive curriculum encompasses various critical aspects of ICT, including private 5G Network architectures, Embedded computing, Integration of the Internet of Things (IoT) and futuristic solution based on AI. Learners will emerge exceptionally well-prepared to conceptualize, implement, and proficiently manage modern businesses and organizations.

### Recommended Integrated Courses

| Course Name                                                                         | Category                      | Credits | Semester |
|-------------------------------------------------------------------------------------|-------------------------------|---------|----------|
| Critical Thinking, Design Thinking, Leadership and Teamwork*                        | Behavioral/ Functional Skills | 3       | I        |
| Programming Fundamentals for Engineers                                              | Functional Skills             | 3       | II       |
| Industrial Applications of Microcontrollers - A Practice based approach             | Technical Skills              | 3       | III      |
| Cyber Physical Systems for industrial Applications                                  | Technical Skills              | 3       | IV       |
| Fundamentals of Microsoft Azure                                                     | Technical Skills              | 3       | V        |
| Applied industrial IoT                                                              | Technical Skills              | 3       | V        |
| Drone Technology and its Transformative Applications - A Practitioner's Perspective | Technical Skills              | 3       | VI       |
| Career Readiness in Digital Era*                                                    | Behavioral Skills             | 3       | VI       |
| Artificial Intelligence and Edge Computing                                          | Technical Skills              | 3       | VII      |
| 5G Technology for Smarter and Secure Connectivity                                   | Technical Skills              | 3       | VIII     |
| Total Credits                                                                       |                               | 30      |          |

#### Mode of Delivery:

Self-paced learning + Expert session (VILT) – 30 hours, Project work – 15 hours

\* Face-to-face instructor led sessions / VILT sessions – 45 hours  
(including project work)



# Industrial IoT and Smart Systems

Integration with B.E. / B.Tech.: ECE, EEE & E&I

## Job Roles

- ▶ Embedded Engineer
- ▶ Field Test Engineer
- ▶ Network Planning Engineer
- ▶ Telecom Engineer
- ▶ Embedded System Developer
- ▶ R&D Engineer
- ▶ Drone Engineer

## Skills

- ▶ **Embedded Board I/O Configuration:** Ability to configure sensors and actuators
- ▶ **Programming:** Ability to code in Embedded C, MicroPython
- ▶ **API Interface:** Ability to integrate sensor, Microcontroller and Wireless networks
- ▶ **Problem Solving:** Ability to think in alignment with requirements and solve the problems
- ▶ **Design:** Ability to use design tools to design modules of Drones and 5G Networks

## Software Tools

### Software

- ▶ Edsim51 ▶ Tinker CAD ▶ Arduino IDE ▶ Wokwi
- ▶ ThingSpeak ▶ Adafruit ▶ Thonny IDE ▶ WEKA
- ▶ Cisco Packet Tracer ▶ Jupyter NoteBook ▶ Tiny ML
- ▶ Embedded C ▶ MicroPython ▶ Open Air Interface (OAI)

### Hardware

- ▶ Arduino UNO ▶ ESP 8266 ▶ ESP 32
- ▶ Nano 33 BLE Sense ▶ Raspberry Pi Pico
- ▶ DJI Mini 2 ▶ DIY KIT Drone
- ▶ Drone Gimbal set ▶ Arduino UNO
- ▶ STM 32 Board ▶ Raspberry Pi 4 Node B

## Potential Recruiters

