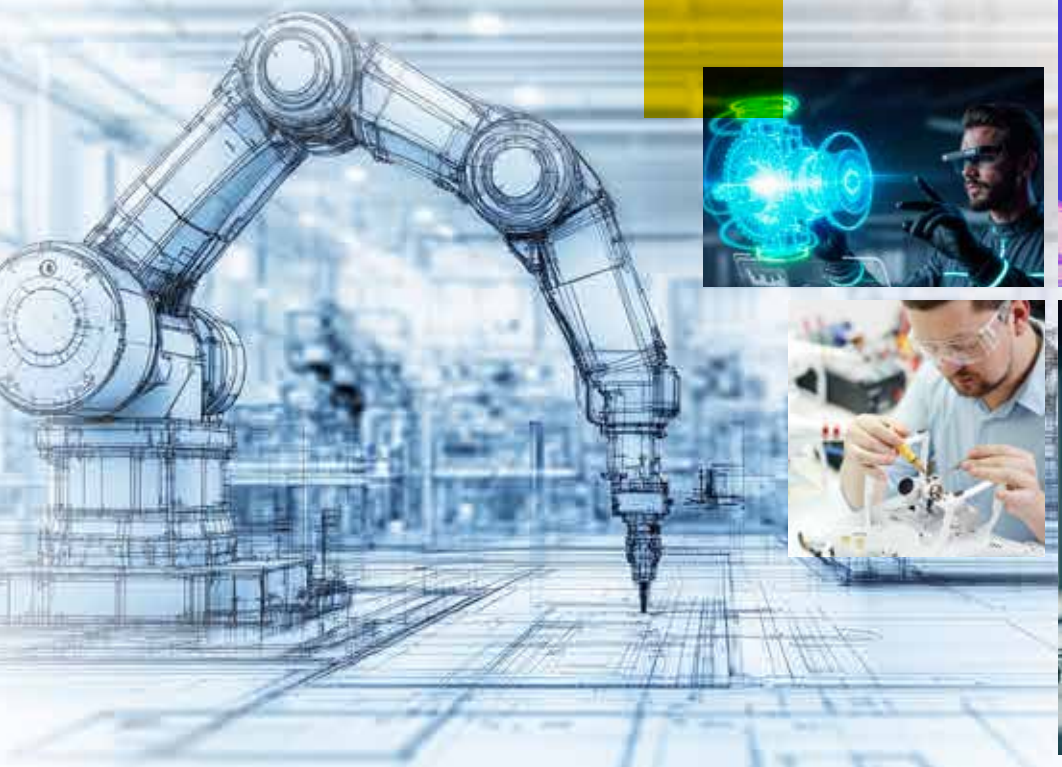
BITS Pilani
Pilani | Dubai | Goa | Hyderabad | Mumbai

WORK INTEGRATED
LEARNING PROGRAMMES

46 Years of Delivering Excellence

SMART MANUFACTURING COMPETENCY CENTRE (SMCC)
BENGALURU



Index

BITS Pilani:
An Institute of Eminence

BITS Pilani:

Since 1964, BITS Pilani has been a pioneer in higher education, recognised as an Institute of Eminence by the UGC and Ministry of Education. Known for academic excellence, it has grown into a globally respected institution and was the first Indian university to establish an international campus in Dubai.

Welcome to BITS Pilani's Work Integrated Learning Programmes (WILP)

At BITS Pilani WILP, we blend education with professional growth through tailored programmes aligned with both business and learner goals. Professionals gain new skills, adopt best practices, and make a meaningful impact, while organisations benefit from increased productivity, retention, and a motivated workforce.
Our UGC-approved programmes offer real-world, practical knowledge, ensuring lasting success.

46
Years of legacy

1,36,904
Working Professionals Graduated

353
CEOs and Founders

4,997
Global Heads, Presidents & Directors

367
Organisations Trust Us As Learning Partner

50,117
Working Professionals Currently Enrolled

Objectives of SMCC Bengaluru

The Smart Manufacturing Competency Center (SMCC), **Bengaluru** is an initiative by **BITS Pilani** to create an integrated ecosystem that brings together experiential learning, industry collaboration, faculty development, applied research, and digital manufacturing innovation. The center enables students, faculty, and industry professionals to work on real-world challenges across Industry 4.0 and Industry 5.0 domains, using state-of-the-art laboratories, industry-grade tools, and collaborative project environments.

Campus Immersions

Structured learning programmes offering hands on exposure through physical equipment, real test setups, and advanced simulation tools. Designed to strengthen system level understanding beyond theory.Structured immersion programmes providing hands-on exposure to industrial automation systems, robotics, machine vision, digital twins, and IoT-based setups. These experiences are designed to bridge the gap between theory and practice, enabling strong system-level understanding.

Research and Innovation

Focus on applied research, rapid prototyping, and solution development in areas such as digital twins, predictive maintenance, smart inspection, and connected manufacturing, through close collaboration with industry partners.

Practice School (PS-I and PS-II) Opportunities

Industry-aligned training pathways integrated into PS-I and PS-II, offering:

- Mechatronics pathway with Siemens SMSCP certifications (L1, L2, L3)
- Electronics and semiconductor pathway with PCB design and SI/PI analysis using Siemens EDA tools

Students work on industry-relevant projects and capstones, enhancing professional readiness and global employability.

Organisational Problem Solving

Collaborative engagements with industry to address real manufacturing challenges, including process optimization, automation, digital transformation, and system integration—delivering practical and implementable solutions.

Faculty Development Programmes (FDPs)

Focused capability-building initiatives to upskill faculty in areas such as mechatronics, digital twin development, industrial IoT, machine vision, robotics, cybersecurity, and semiconductor design, supported through train-the-trainer certifications and hands-on workshops.

M.Tech Dissertation and Research Support

Access to advanced laboratory infrastructure, industrial datasets, and expert mentorship to support industry-driven postgraduate research in smart manufacturing and digital engineering domains.

Industry 4.0 Maturity Assessment and Advisory

Structured assessment and advisory initiatives to evaluate an organization's digital manufacturing readiness using globally recognized frameworks. These engagements focus on identifying current maturity levels, technology gaps, and transformation opportunities across areas such as automation, data integration, connectivity, and analytics.

Certification Programmes

Designed for students, faculty, and working professionals to build competencies aligned with current and emerging industry needs.

- Siemens Certified Mechatronic Systems Assistant
- Siemens Certified Mechatronic Systems Associate
- Siemens Certified Mechatronic Systems Professional
- Industrial Automation – PLC Programming
- Industrial Automation – Communication Protocols
- Industrial Automation – IoT
- Industrial Automation – Diagnostics and Troubleshooting
- Modernization of Legacy Systems
- Digital Twin Development
- Applied AI-ML for Manufacturing
- Machine Vision–Based Quality Inspection
- Siemens EDA PCB Design
- Siemens EDA PCB Design – Advanced

Smart Manufacturing Laboratory Infrastructure

The SMCC will house a set of industry-grade laboratories designed to replicate the key components of a modern smart factory ecosystem. These labs will allow students and professionals to experiment with real industrial technologies and integrated automation systems.

Mechatronics Lab

- Siemens Modular Mechatronics System certified for SMSCP Level 1 & Level 2 (globally recognized)
- Hands-on exposure to industrial automation architecture
- Equipped with industry-grade sensors, actuators, PLCs, and microcontrollers
- Supports real-world automation and integration projects
- Troubleshooting skills

Machine Vision Lab

AI-enabled Quality Inspection Systems

- Fixed system for testing samples with and without AI capability
- Lab-in-a-Box solution for on-site industry deployment
- Enables defect detection, inspection automation, and validation
- Ideal for industry PoCs and applied research

Industry 4.0 / 5.0 Lab

Digital Twin & Smart Manufacturing Systems

- Laser engraving system with foundational digital twin (Siemens NX)
- Open system to experiment with Industry 4.0/5.0 use cases
- Access to platforms like:
  - Schneider Digital Twin Software
  - Dassault Systèmes 3DEXPERIENCE
  - Open-source twin-building tools
- Enables virtual commissioning and system optimization

Industrial Robotics Lab

Advanced Robotics & Automation

- Epson 6-Axis Industrial Robot
- Focus on robot programming and automation workflows
- Upcoming additions:
  - AMRs (Autonomous Mobile Robots)
  - Cobots (Collaborative Robots)
- Supports real industrial use-case experimentation

Extended Reality Lab

Immersive Manufacturing Experiences

- Augmented Reality (AR) for maintenance and guidance
- Virtual Reality (VR) for shopfloor simulation
- Assistive Reality for collaborative workforce training
- Enables safe, scalable, and remote industrial training

Prototyping Lab

Innovation & Rapid Development Space

- 3D Printing for fixtures and components
- Tabletop CNC machines
- Solder rework station & PCB prototyping
- Optical, electrical, and mechanical characterization tools
- Supports rapid prototyping and PoC development

Industry Collaboration Opportunities

Industries can engage with
the SMCC through multiple collaboration models:

- Joint research and development projects
- Corporate training programmes for engineers
- Sponsored student projects
- Sponsored PhD research
- Pilot implementation of digital manufacturing technologies
- Internship and recruitment pipelines

Expected Impact of SMCC

The Smart Manufacturing Competency Center aims to create impact across three key dimensions:

Education

- Hands-on training for students and professionals
- Industry-aligned certifications and skills development
- Internal capability building through faculty development programmes

Research

- Applied research addressing real manufacturing challenges
- Development of digital/smart manufacturing solutions

Industry Engagement

- Strong academia–industry collaboration
- Industry 4.0 maturity assessments
- Accelerated adoption of smart manufacturing technologies

BITS Pilani
Pilani | Dubai | Goa | Hyderabad | Mumbai

WORK INTEGRATED
LEARNING PROGRAMMES

Workforce Transformation Since 1979

bits-pilani-wilp.ac.in

Smart Manufacturing Competency Centre
1st floor, 104/1, Aishwarya Crystal Layout, Singasandra,
Bengaluru, Karnataka 560068

Prof. Prakruthi Hareesh
Centre Head

Prof. Robin C Jayaram
Center In-charge

Mr. Tanmay R Chaudhary
Labs-in-charge

Contact Details: smcc.blrlabs@wilp.bits-pilani.ac.in

BITS Pilani WILP Head Office
BITS Pilani Hyderabad Campus, Jawahar Nagar,
Medchal District, Telangana, India – 500 078

Other Competency Centres
Chennai I Pune

Regional Offices
Gurgaon I Mumbai I Pune I Hyderabad I Chennai I Bengaluru