



INDUSTRY 4.0 

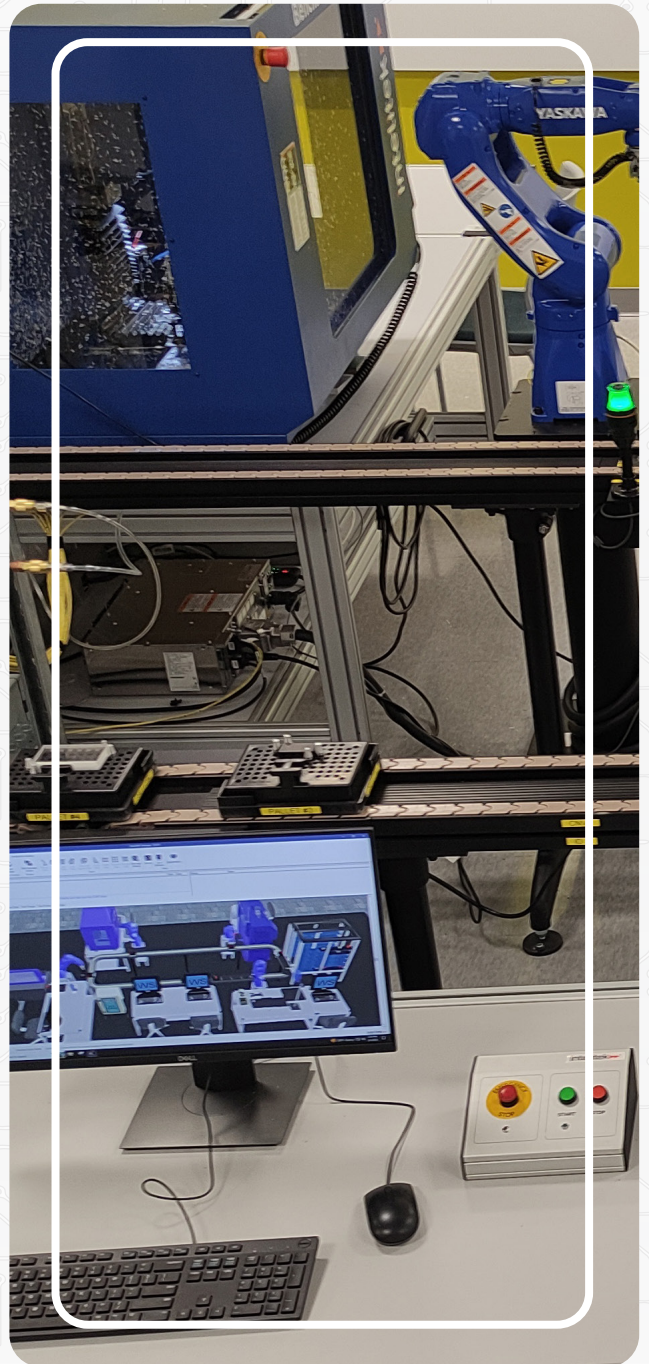
Industry 4.0 for Education

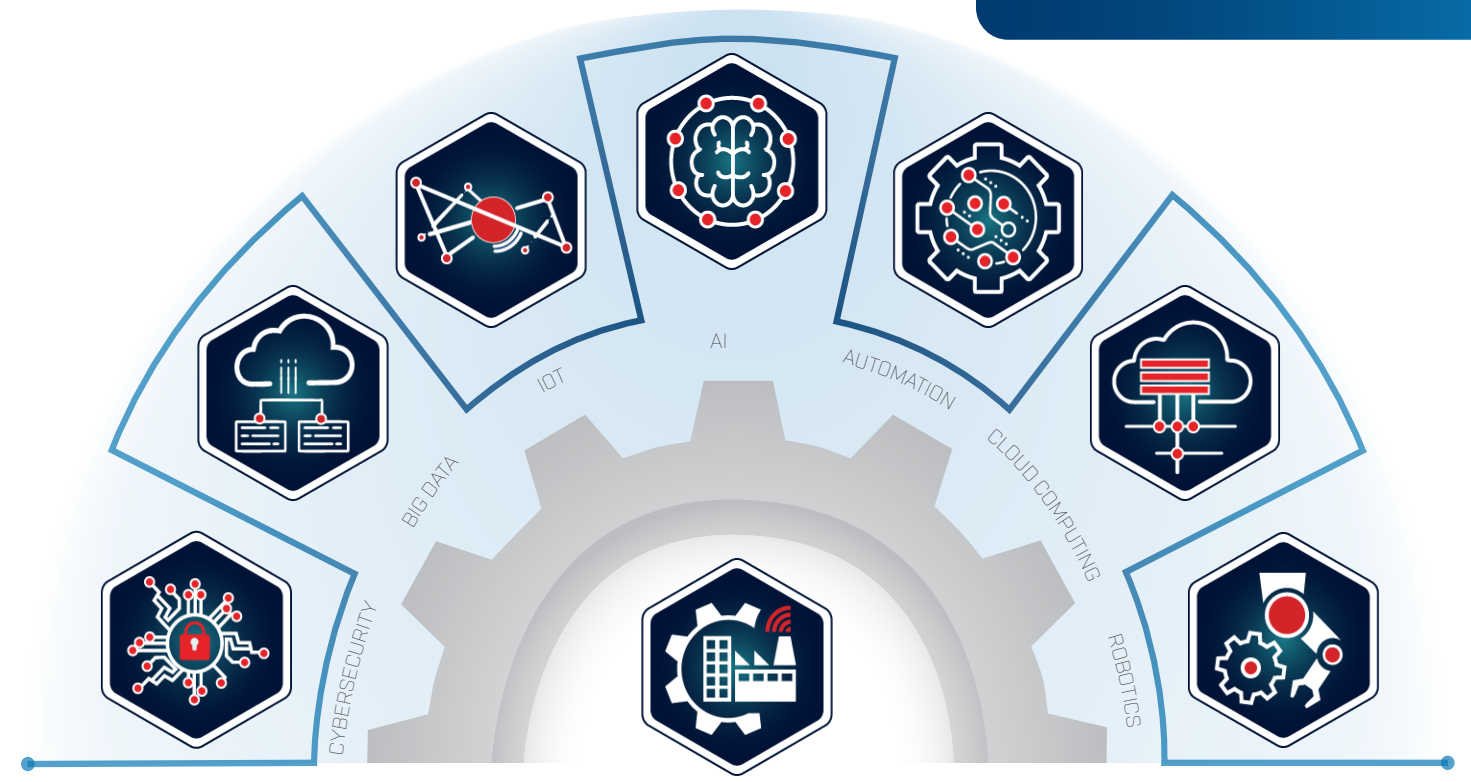
Industry is adapting fast and the fourth industrial revolution adopts the internet to use automation, data and system transparency to improve processes and make processes more efficient.

Intelitek's structured, skill-tiered programs educate new and veteran students with competencies that will help them succeed in advanced production and logistics businesses.

This multi-disciplinary and system-based training approach introduces students to the job skills and employment skills that will help them succeed in leading-edge industry.

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The Industry 4.0 Revolution

Using the Industry 4.0 model, companies with industrial processes, automated logistics, and computer integrated manufacturing plants take advantage of advanced automation and information technologies to monitor, maintain, and optimize their systems in real-time.

The Problem

As Industry 4.0 becomes more widely adopted, thousands of new jobs and new career options will be created that do not currently exist. Schools worldwide need to adapt and upgrade traditional technology education to prepare students for these in-demand and high paying jobs in industry.

Combining theory instruction, online, on-demand learning, and hands-on practical labs, Intelitek's programs enable student learning and provide real experience with real equipment. The programs align with industry credentials to ensure students meet industry accepted practices.

Intelitek culminates programs with practicum - capstone project environments where the skills, knowledge, and hands-on education is combined to run systems where students practice integration, operation, maintenance, and system optimization.

The Solution

The program focuses on three aspects of training:

- Core technology skills - so students understand and are skilled in the technologies and how they work.
- Interdependence of systems - the communications, automation, and interaction of systems within an industry 4.0 environment.
- The benefits of Industry 4.0 systems - the business aspects and the personal skills required to work in the collaborative world of industry.

Building Expertise in Industry 4.0 Technologies

Industrial Training Programs for Industry 4.0

The Intelitek Industry 4.0 training framework is a stackable and modular approach where certificates and micro-credentials can be awarded to students or incumbent employees in different phases of their academic life or working career.

The multi-level curriculum and lab exercises differentiate between introductory level and advanced integration levels.

Working with industry, Intelitek has crafted a comprehensive training roadmap with curriculum, smart factory capstone labs and lab exercises focused on technical skills and problem-solving skills.

The framework aligns to industry certification programs including industry micro-certifications from leaders like Siemens, Yaskawa, Allen-Bradley, and Cognex.

Industry 4.0 training enables technical high schools, 2 and 4 year college programs, as well as industry training programs and apprenticeships, to offer NIMS credentials to students in the program. Intelitek systems have been successfully used to teach entry level technical programs to advanced university level engineering degree programs.



It's All About Employability

The concept of Industry 4.0 centers around multi-disciplinary systems and integration. Industry employers are searching for candidates who think outside the box, who have soft skills in addition to technical skills.

Intelitek's approach to education for advanced manufacturing includes modular curriculum, granular content, hands-on projects, and capstone training that lead to industry recognized credentials. With this interactive, collaborative approach, students learn planning, time management, communication and job skills that enhance their employability.

Career Opportunities for Industry 4.0 Graduates

Industry 4.0 Integrator

Design | Integration | Optimization

- Industry 4.0 Integrator
- Systems Designer
- Process Engineer
- Integration Specialist
- Operations Supervisor

Industry 4.0 Specialist

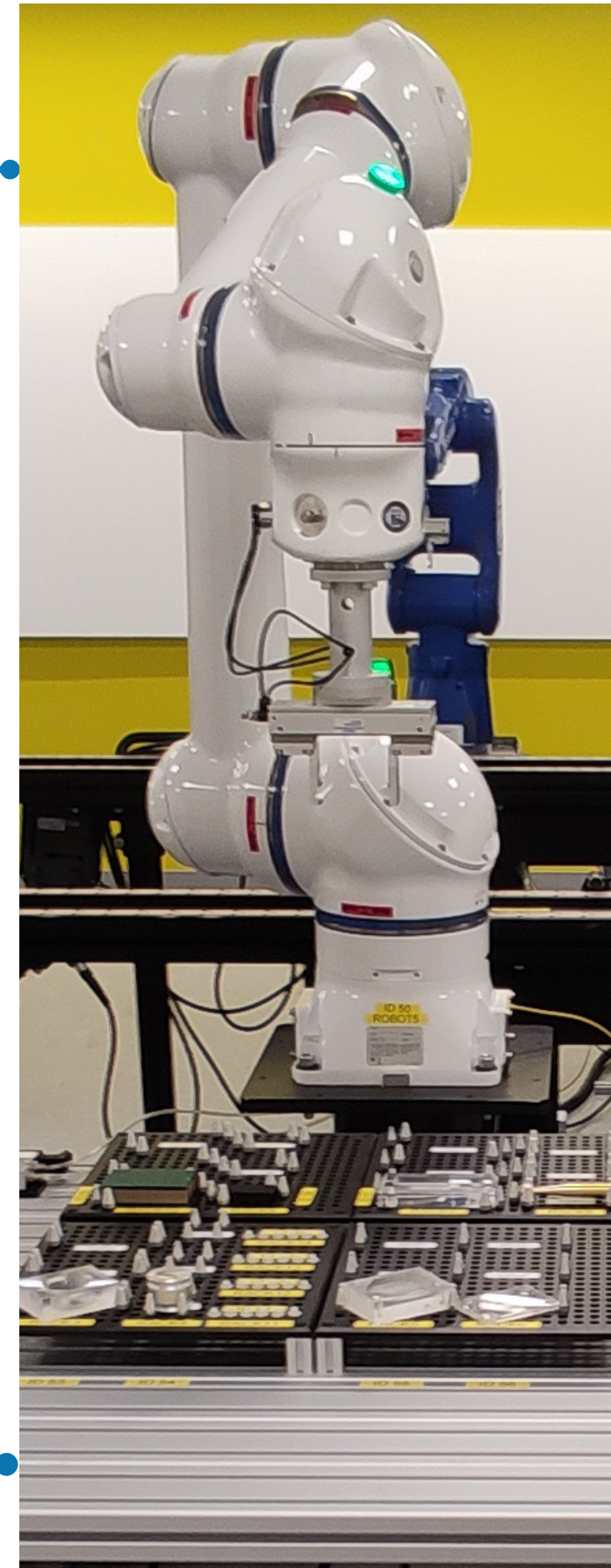
Process | Programming | Interoperability

- Mechatronics Specialist
- Robotics Specialist
- Applications Engineer
- Maintenance Technician
- Operator/Installer

Industry 4.0 Technician

Technical Expert | Credentials | Maintenance Technician

- Electromechanical Technician
- Production Technician
- Systems Operator
- Maintenance Supervisor



Graduates will be able to:

- Grasp the concepts of Manufacturing and Industry 4.0 Smart Factories
- Understand and operate independently in an industrial setting
- Identify the role of components in manufacturing processes
- Operate and maintain a system at maximum capacity
- Recognize, troubleshoot, and repair malfunctions
- Fully comprehend the role of smart devices, data analytics, and IoT connectivity in a plant
- Understand fundamentals of networking and be fully aware of cybersecurity threats
- Model and simulate a manufacturing cell or system
- Design and implement a manufacturing cell or system
- Understand, operate, troubleshoot, and optimize production lines
- Integrate, operate and troubleshoot automation-controlled systems
- Be familiar with advanced manufacturing software tools like Virtual Reality, Simulation, Digital Twinning, Manufacturing Execution Systems (MES) and Artificial Intelligence
- Understand the benefits of Industry 4.0, and the opportunities and risks of the technologies

Certification aligned with:

NIMS
ITM & Industry 4.0
Smart Standards



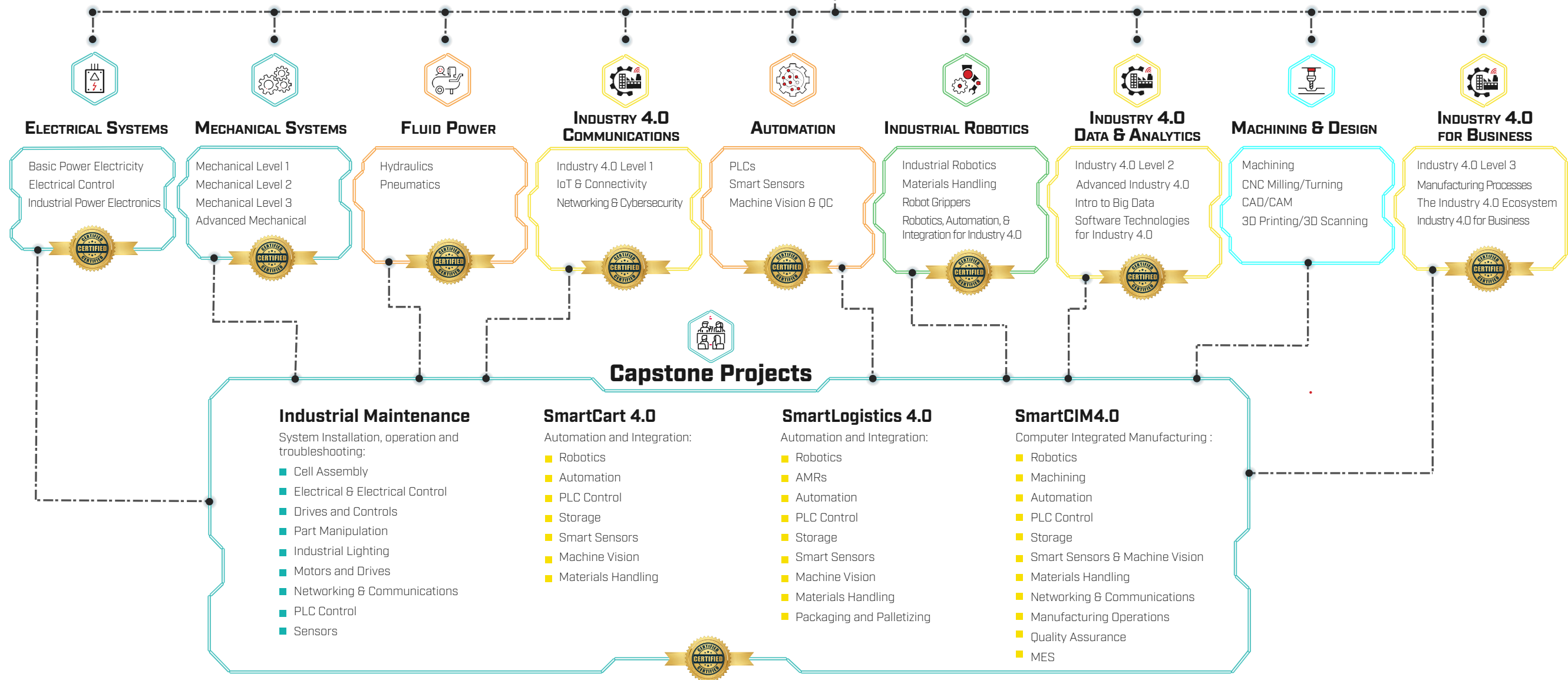
Industry 4.0 Training Pathways

Intelitek advanced manufacturing training programs and industry 4.0 training programs are designed as a flexible learning structure for programs offered in schools and industry. This framework is a recommended pathway that can be adjusted to the technology focus and education level your program needs.

FOUNDATIONS OF MANUFACTURING

Safety Fundamentals	Hand Tools/Power Tools
Employability	Blueprint Reading
Intro to Industry 4.0	Mechanical Measurement & Quality Control
Math for Technicians	Advanced Manufacturing for Industry 4.0
Lean Manufacturing	

Intelitek's content map for education programs focuses on fields related to industry. The content and labs can be used to build programs for industrial maintenance, mechatronics, industrial automation, logistics, and advanced manufacturing and engineering.



Partnering with Industry for Certification

Partnering with industry recognized credentialing bodies and with leading industry vendors like Siemens, Cognex, and Yaskawa to deliver certification. Intelitek courseware and hands on education covers a wide gamut of necessary skills. Using blended learning solutions with e-learning content aligned to industry, simulations, industrial training equipment, and practical lab assessments – students can gain the skills and credentials they need to advance in their careers.

Structured, Tiered Approach to Education

The Intelitek industrial education program highlights all the necessary skills needed to find jobs in industry.

- **Foundations of Manufacturing** introduces students to technology and workplace skills they will need to succeed.
- The **Training Programs** delve into specific skills and how technologies operate in a cohesive industry ecosystem.
- The **Capstone Projects** enable students to implement real-world practical examples of integrated Industry 4.0 environments just like those they will encounter when they find a job.

Industrial Maintenance Cell

The Electromechanical maintenance cell is a full emulation of an industrial plant with a range of mechatronics components for students to construct, operate and troubleshoot. The platform lets students practice relevant skills in the installation, operation, and maintenance of real industrial equipment. The setup of the cell is an integral part of learning and includes curriculum.

Once operational, faults and skills exercises can be introduced to expand the knowledge of the students.

The complex cell includes electrical power distribution and controls, wire and cable tray, wireways, conduit and equipment housings, motors, conveyors, parts manipulation, pneumatics, and industrial lighting.

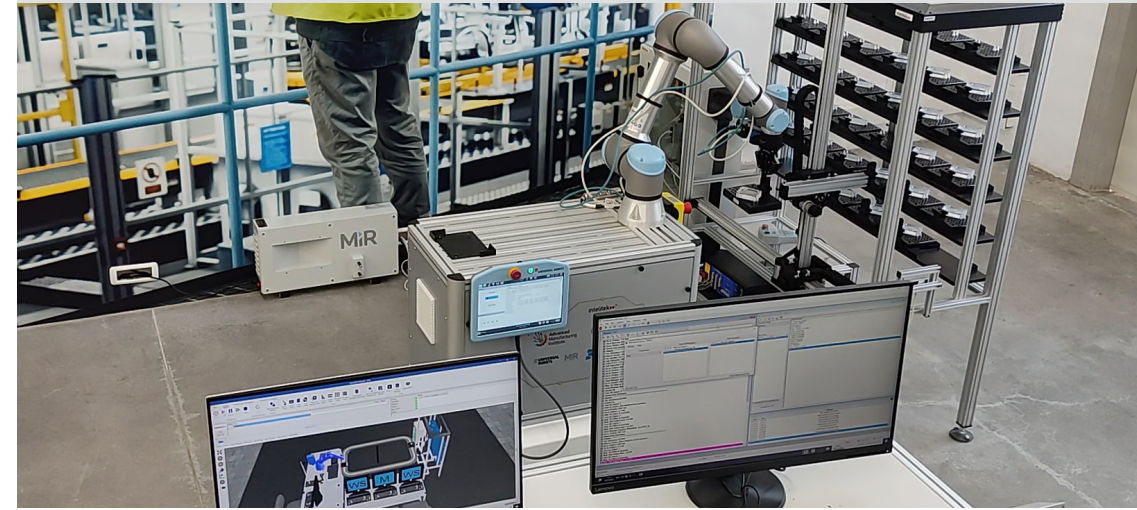
Using industry-standard work orders, standard operating procedures, schematic diagrams and technical manuals as resources, students assemble the system and install the electrical, mechanical, control, and other add-on components.



SmartLogistics 4.0

Fulfillment centers, smart warehouses and production lines are built around integrated industrial systems. The SmartLogistics 4.0 solution is used to educate students on logistics technologies. With the focus on advanced technologies and how they are integrated to deliver automated systems, the platform is an ideal environment to delve into robotics, advanced communication, Internet of Things, data analytics, and system automation.

- Centered around an advanced industrial Autonomous Mobile Robotics (AMR) platform
- Teaches Robotics, Sensors, PLCs, Machine Vision, IoT, Networking, Integration, Automation, and more
- Includes curriculum for all components of the solution with a focus on system integration
- Hands-on, job-ready skills training for an in-demand career path in industry



SmartCart 4.0

SmartCart 4.0 is a modular and flexible solution for educating and training students in the principles and technologies of Industry 4.0 integrated manufacturing.

The cart is a fully integrated Industry 4.0 Education Solution that includes Industrial Robotics, Smart Sensors, PLCs, Machine Vision, IoT, Networking, Integration, Automation, and more. The training environment is aligned with NIMS Industry 4.0 Smart Production certification.

Extensive curriculum from basic to advanced level is included preparing students with hands-on, job-ready skills for in-demand career paths into industry

- Industry 4.0 training to prepare students for jobs in the most advanced companies
- Integrated solution with curriculum, exercises, labs, evaluations, and real industrial equipment
- Multi-technology, flexible, training platform
- Aligned with Micro-credentials and NIMS Industry 4.0 Certification



SmartCIM 4.0

The SmartCIM 4.0 solution is a real production line to introduce CTE and engineering classrooms to the industrial automation and industry applications of modern manufacturing and to create skilled workers for next generation jobs. Using a system-based approach, SmartCIM 4.0 introduces not only individual components of industrial plants, but also the networking and communications, systems integration and management, and operation of the process.

The turnkey system includes the hardware, software, curriculum, and support required to develop a sustainable program.

This sophisticated, interconnected manufacturing configuration that has the components found in industrial processes including industrial robots, automated production workstations, automated storage and retrieval systems (ASRS), assembly stations, quality control, and machining stations all linked by a continuous-loop conveyor, a central management control station, a TCP/IP communication network, and Intelitek's OpenMES software.

Curriculum

Introduction to Industry 4.0

Offers a window into the impact of the Fourth Industrial Revolution and its accompanying technologies on the modern manufacturing industry. Using examples and analogies from real-world enterprises, the course explores Industry 4.0 concepts, processes, and technologies, and testifies to how these components interconnect together in order to grow the manufacturing industry of the future.

Introduction to IIoT & Connectivity

Focuses on the vast network of smart sensors and devices and their impact on the manufacturing world. This course also explores topics related to the interconnection of IoT and industrial devices, such as SCADA systems, cloud computing, edge computing, and machine vision systems.

Introduction to Networking & Cybersecurity

An in-depth look at communication exchange in modern industry, from the network, to the Internet, to the Industrial Internet of Things (IIoT) and Cloud technologies. The course covers key networking principles, and concentrates on the structure and importance of industry-focused cybersecurity exploring threats that manufacturing entities have to contend with and combat.

Introduction to Big Data for Industry

Explores the world of data, including its collection, processing, management, visualization, and uses. The course delves into the significance of big data in cutting-edge manufacturing, and looks at machine learning, predictive analytics, data modeling, simulation, and the improvement of processes using data.

Advanced Industry 4.0 Concepts

Explores how technologies interact with each other and with industrial components to create efficient, productive, and profitable enterprises. Emphasizing use cases, the course investigates digital threads, flexible manufacturing, predictive maintenance and inventory and asset tracking.

Advanced IIoT and Connectivity

Advanced IIoT and Connectivity focuses on the network of smart sensors and devices that is the Internet of Things (IIoT) and how systems are integrated and deployed in industrial environments.

Advanced Cybersecurity for Industry 4.0

Explores cybersecurity concepts and investigates ways that cyber-attacks can occur and be prevented in industrial control systems and IIoT networks. The course gives an overview of the hardware and software elements in the Cybersecurity ecosystem like firewalls, antivirus software, malware, and examines the risks of a cloud based, internet connected, manufacturing environment.

Software Technologies for Industry 4.0

Explores the different types of software essential for a company's success in the automated commercial and industrial landscape. Delves into APS, MES and ERP systems and the role each plays in a company. The course also discusses tools used in manufacturing like machine vision for quality control, AR/VR for training, business intelligence software and data modeling tools.

Advanced Data Science for Industry 4.0

Data collection, storage, and analytics play a very significant role in the manufacturing industry. The vast amounts of data generated by production processes and the potential involved in the use of this data creates substantial economic opportunities for businesses that take advantage of them. The course explores how the proper use of data can help manufacturing enterprises significantly improve their bottom line.

Industry 4.0 - The Ecosystem

Takes a macro level look at Industry 4.0 Smart Manufacturing and the trends and use cases for technology. The content discusses Industry 4.0 business benefits like

- Flexible Mass Production
- Real time business processes
- Enhancing the customer experience
- Competitive industrial production
- Customized mass production
- Maintaining production through improved reliability/quality

Industry 4.0 for Business

Takes a look at industry 4.0 from the business perspective. The course will look at the benefits and justifications for manufacturing like customer satisfaction, information transparency, customized mass production, intelligent decision making, and asset management. The content also delves into:

- Business 4.0
- Supply chain 4.0
- Quality 4.0
- Maintenance 4.0

Tiered Content Aligned with Jobs in Industry

Multi level, flexible content can be used for different target student audiences.

Establishing Core Skills

Students develop a core understanding of manufacturing concepts and components. The programs provides an interdisciplinary overview of the theory and technology common in Industry 4.0. The outcome is a core knowledge of systems for an operations or maintenance technician role with responsibility for operation and service of equipment.

Establishing Specialist Skills

Students become specialists and learn about the entire eco-system and the co-dependence of elements. The objective is for graduates to be skilled in implementing, operating, optimizing and analyzing the system as a whole. The outcome is to understand how components interact and gain in depth knowledge of operation, programming, and maintenance of the system.

Industry 4.0 Integrator Proficiency

Students will learn to combine all their skills to develop integrated and complex Industry 4.0 systems. The objective is to learn systems knowledge, sound engineering practices, and the macro side of industry process and process design. The outcome will be students able to be part of Industry 4.0 integration, design and planning teams.



Aligned to Industry 4.0 Credentials from NIMS

Intelitek curriculum and activities are aligned with the National Institute for Metalworking Skills' (NIMS) Smart Training Solutions. Intelitek provides a NIMS approved Performance Measure for NIMS Industry 4.0 Smart Production Specialist Credentials ensuring students can complete and achieve NIMS certification for Industry 4.0



Intelitek Industry 4.0 Training Program

Industry 4.0 is a concept where industrial processes and manufacturing plants take advantage of the most advanced technologies and leverage data collected in real-time from the factory floor to monitor, maintain, and optimize the operation in real-time.

The Intelitek training programs for Industry 4.0 focus on three aspects of training: first, the core technology skills so students can understand the technologies and how they work; second, the interdependence of systems, the communications, automation, and interaction of systems within an industry 4.0 environment; and third, the benefits of integrated industry 4.0 systems and the employability skills required to work in this new, collaborative world of industry.



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