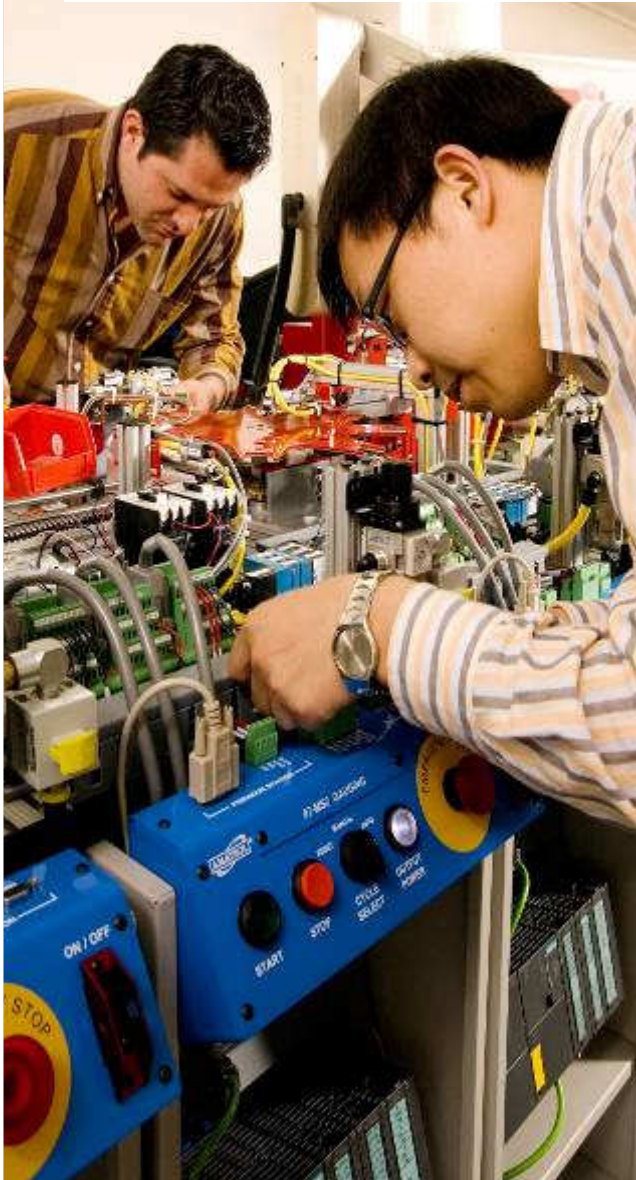


SIEMENS

Siemens Mechatronic Systems Certification Program (SMSCP)



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Why choose Siemens as an education partner?

Siemens

Mechatronic

Systems

Certification

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Vision/Mission

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Support

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Siemens AG Siemens Professional Education

Siemens is the world leader in mechanics and automated systems technologies.

Siemens has over **100 years of experience in technical education**. In Germany alone, Siemens is one of the largest education providers.

Siemens Technik Akademie Berlin

The only **international** higher level engineering and technology academy within the Siemens Professional Education System.

Founded in 1998 to train students in engineering technology and applied mechatronics

Siemens Technik Akademie (STA) Berlin

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Training Approach

STA Berlin's training approach is grounded in the renowned German system of technical education. The special teaching and learning approach is the result of long experience with technical programs in international contexts to develop „**Handlungskompetenz**“.

Concept of “Handlungskompetenz”:

Teaching students how to apply existing technical knowledge to new professional situations

Teamwork and collaborative problem solving in an industrial environment

Stresses system analysis and understanding

Mechatronic

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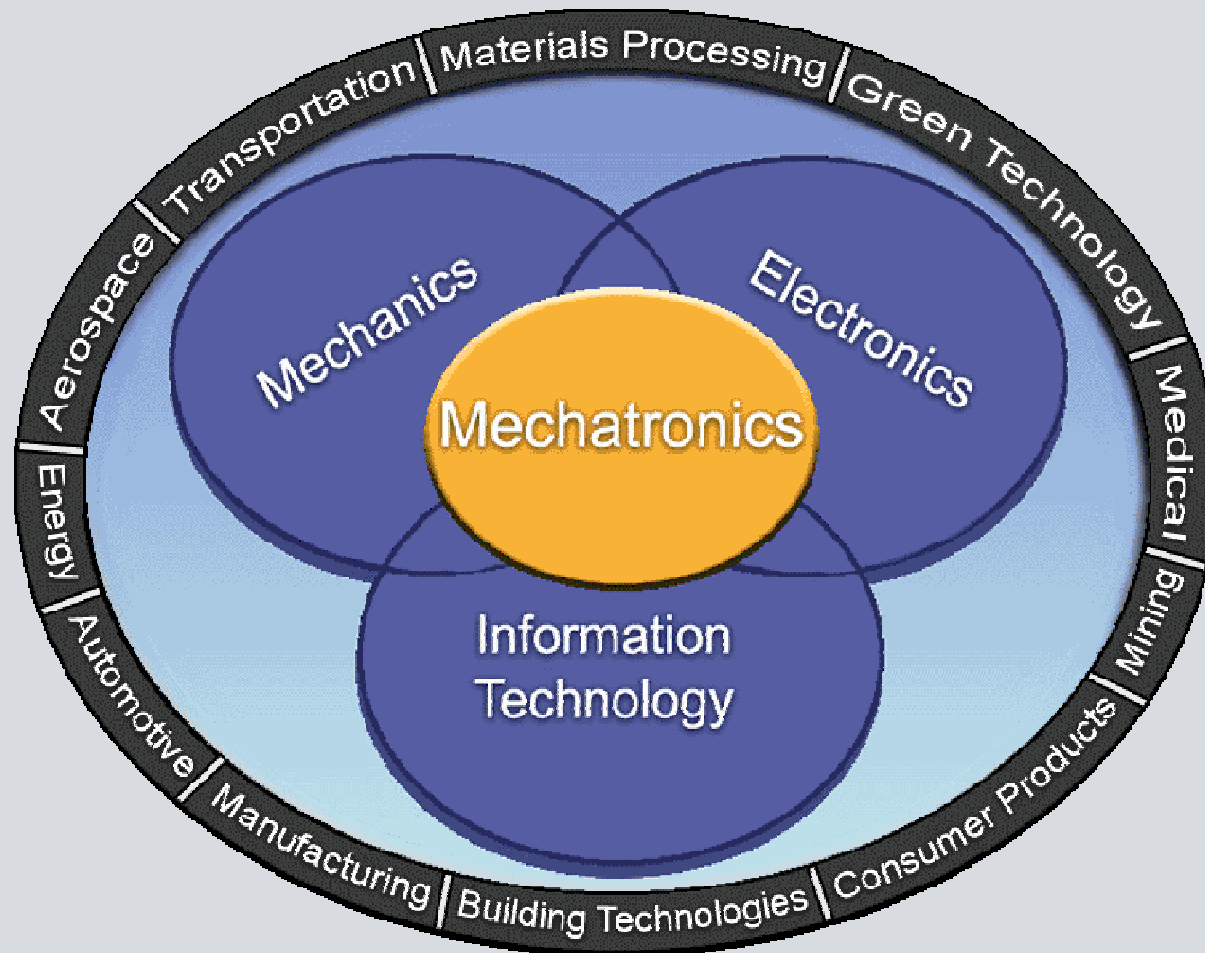
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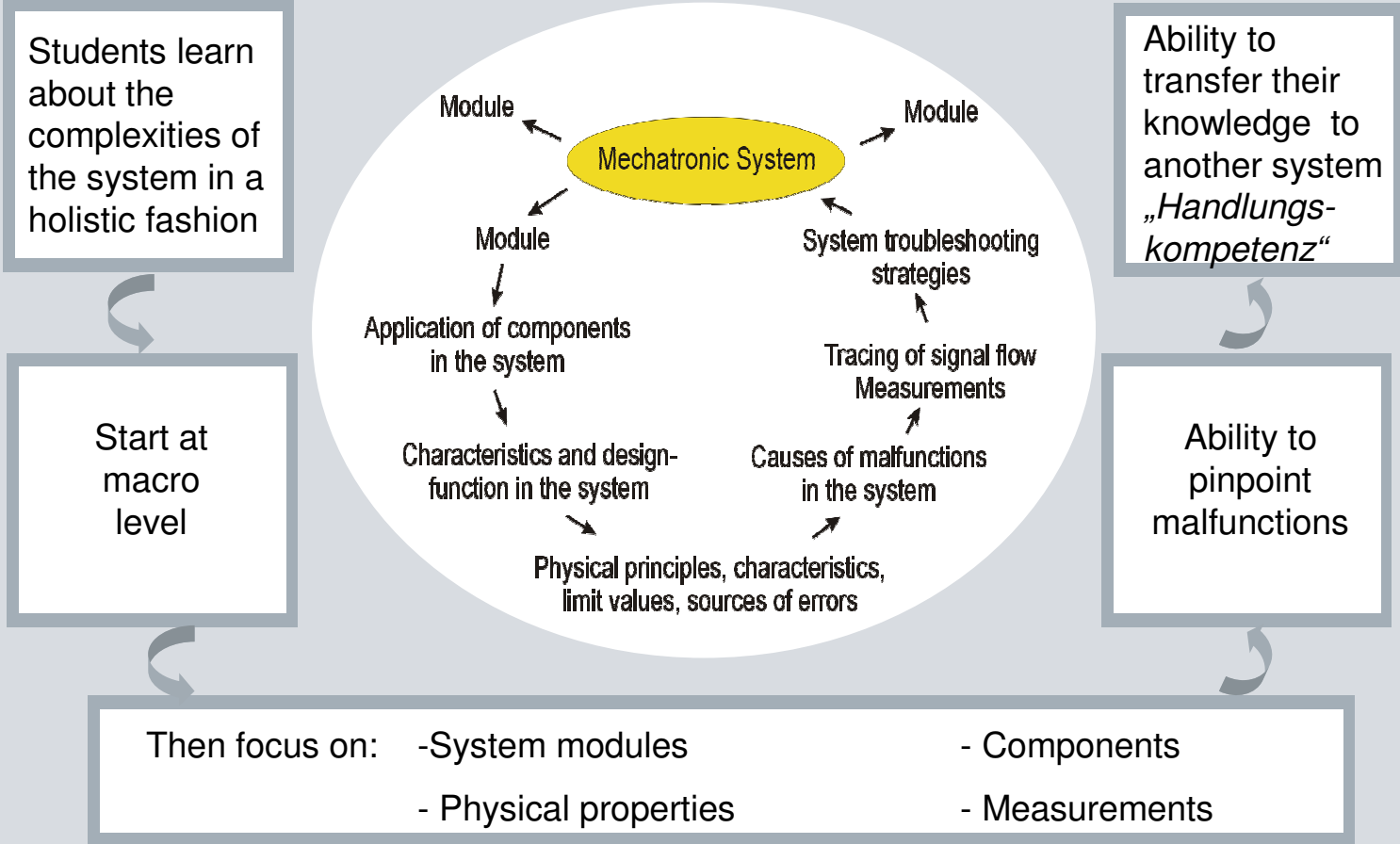


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Siemens Professional Education

System Approach Learning Loop: Holistic, Hands-On Mechatronic Education

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System Approach: Holistic, Hands-On Mechatronic Education

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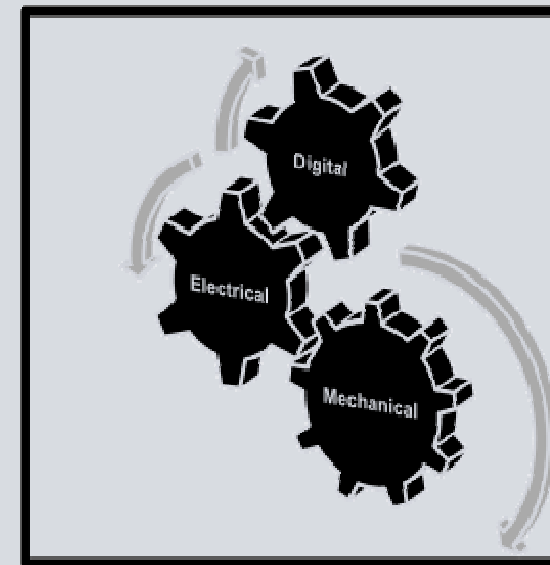
Partners

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With its system focus and holistic learning model, SMSCP's System Approach stresses:

- The Mechatronic System is **always** the “starting point”
- Contextual, Hands-on Learning of Theoretical Principles using a Mechatronic System
- Understanding of Subsystems Interrelationships and How They Drive System Function Together
- Comprehensive Troubleshooting & Systems Analysis

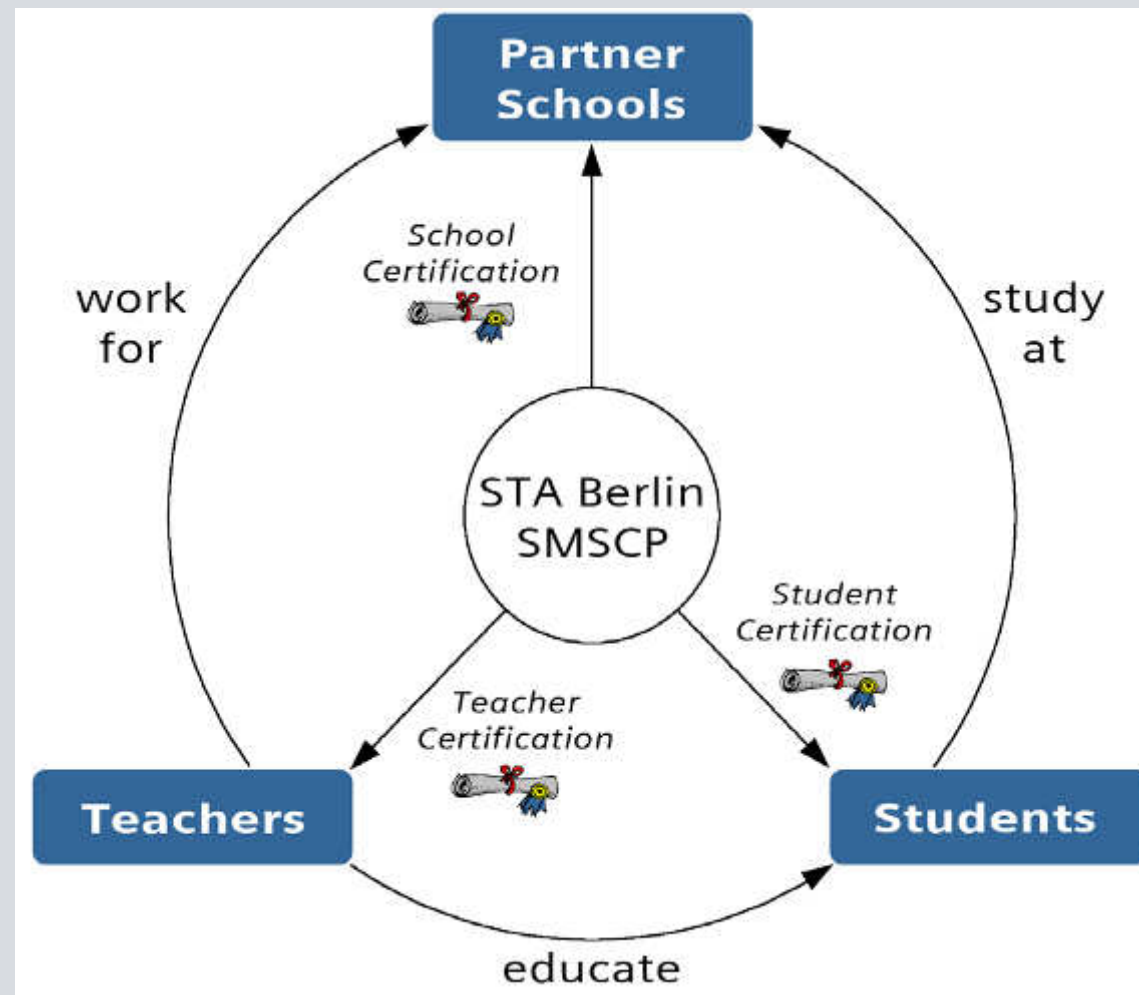


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SMSCP Certification Process

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1st step: Instructor Certification

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Goal:

- Enable instructors from partner schools to implement and teach the Siemens Mechatronic Systems Certification Program at their local school.



Content and Structure of the Instructor Certification Course:

- System Approach teaching method
- Learning and practicing how to apply the System Approach teaching method in the classroom and lab environments
- Introduction to the content of the course-specific curriculum of the respective SMSCP Level
- Courses are 2-3 weeks long and normally held at Siemens Technik Akademie Berlin

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2nd step: Implementation at the Partner School

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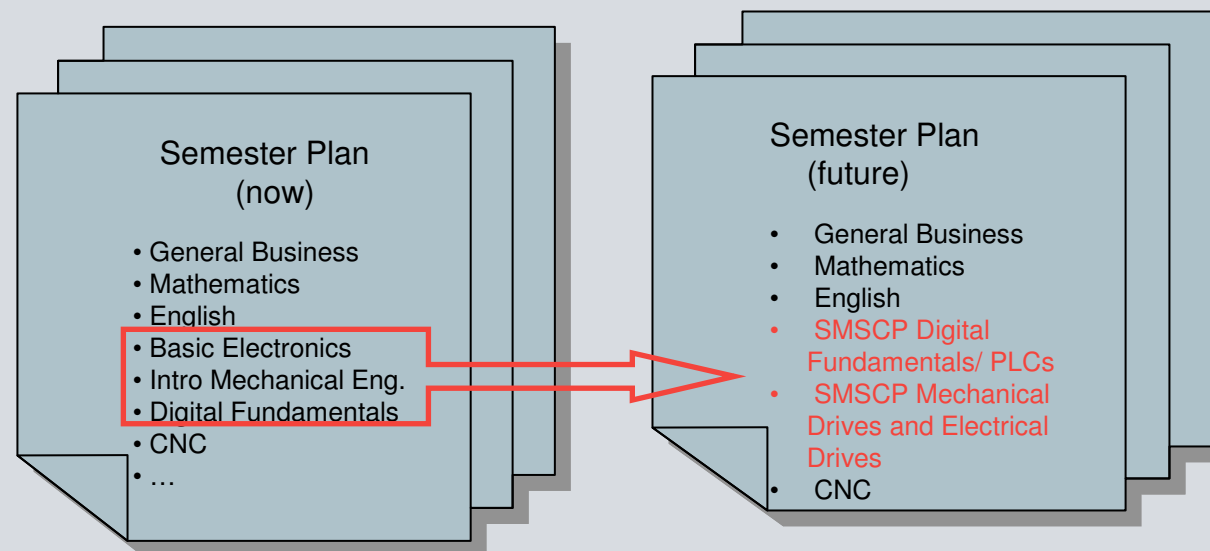
Partners

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Implementation of the SMSCP at the partner schools

- Certified instructors and the respective administrators at the school implement the Siemens Mechatronic Systems Certification Program at their institution.
- The SMSCP is designed to complement and fit into existing programs of study, not replace them.
- Flexible implementation opportunities – as part of existing study programs, weekend – or evening courses



3rd step: Certification of Students

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Goal:

To prepare students well for working in professional technical environments and give them an opportunity to receive **both** an industry certification **and** a traditional technical education diploma at the same time.

Three levels of student certification that are built on job profiles:

Level 1:

Siemens Certified Mechatronic Systems Assistant

- emphasis on efficiently operating complex mechatronic systems, troubleshooting and foreseeing problems

Level 2:

Siemens Certified Mechatronic Systems Associate

- focus on systems management, investigation, repair and troubleshooting.

Level 3:

Siemens Certified Mechatronic Systems Professional

- corresponds to university-level engineering education, emphasis on systems design and process optimization



Program Overview

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- Siemens industry certification in mechatronic systems
- Comprehensive skills certification offered in three levels, not a product certification
- Delivered together with partner schools
- Consistent standards of achievement worldwide
- Verified through certification examinations

Result: Well-grounded individuals who can adapt to new work situations quickly and appropriately - „Handlungskompetenz“

Program requirements

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- Entire program, including instruction must be in **English**
- Must have a **Mechatronic Training System** on site
- SMSCP course instructors must be certified through the SMSCP **Instructor Certification Courses**
- Schools must have a **written agreement with Siemens** on program implementation



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Siemens Professional Education

Vision and Mission

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SMSCP Vision

“The Siemens Mechatronic Systems Certification Program aims to be the world’s premier comprehensive skills qualification.”

The Mission of the SMSCP is:

- To establish the international industry standard comprehensive skills certification in mechatronic systems.
- To provide the STA Berlin’s pedagogical and technical expertise to partner schools around the world.
- To add value to our Partner School’s existing programs of study.
- To learn from our customers and partners in order to improve our knowledge and our offerings.
- To develop Handlungskompetenz in the world’s workforce.

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SMSCP launch in **South Korea, India and South Africa**

New Partnership with **US colleges** - Purdue University, Virginia Western Community College, Central Piedmont Community College

2011

2010

New Partnerships with **colleges in the U.S.**

Partnership with **Intelitek**

2009

First students successfully passed **SMSCP exam**

SMSCP launch in **Singapore**

2008

First Instructor Certification Event

SMSCP launch in **Malaysia**

New Partnerships with **US colleges**

Partnership with **Festo Didactic**

2007

SMSCP launch in **China and Kentucky**

Partnership with **Amatrol**

2005/2006

2004 — **SMSCP concept development**

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Level 1 – Siemens Certified Mechatronic Systems Assistant

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Support

Contact

- Intelligent machine operator with „**Handlungskompetenz**“
- Emphasis on efficient operation and troubleshooting
- Four courses:
 - Electrical Components
 - Mechanical Components and Electric Drives
 - (Electro) Pneumatic and Hydraulic Circuits
 - Digital Fundamentals and PLCs
- Total **recommended (not required)** hours per course: 60 hours

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Level 1 – Job Profile

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Support

Contact

- Well-grounded machine operator who demonstrates “**Handlungskompetenz**” while working in a large-scale system
- Responsible for efficient system operation with minimal downtime
- Malfunctions: localize, identify causes and sources
- Routine, preventive maintenance
- Use system documentation intelligently
- Work as a functioning member of an efficient team
- Observe all local and company safety rules

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Level 2 – Siemens Certified Mechatronic Systems Associate



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Support

Contact

- Technician-level worker with „**Handlungskompetenz**”
- Recommended: significant project work connected to process management
- Six courses cover:
 - Process control technologies
 - Introduction to Totally Integrated Automation
 - Automation systems
 - Motor control
 - Mechanics and machine elements
 - Manufacturing processes
- Total **recommended (not required)** hours per course: 60 hours

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Siemens Professional Education

Level 2 – Job Profile

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Support

Contact

- Manage, investigate, repair and troubleshoot complex mechatronic systems
- Use troubleshooting skills to identify, foresee and prevent possible problems, conflicts and failures, and to systematically and intelligently make repairs
- PLC programming and communications
- Measuring, interpreting and analyzing electrical, PLC/microcontroller and mechanical values
- Apply knowledge of process/project management principles

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Level 3 – Siemens Certified Mechatronic Systems Professional



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Support

Contact

- Engineer-level mechatronic systems education with „**Handlungskompetenz**“
- Emphasis on design, planning, management and execution of technical projects
- Focus on process optimization, cost control and customer satisfaction
- Four courses cover:
 - Mechatronic Systems Design
 - Customized Automation Solutions with TIA
 - Diagnostics, Control Systems and Optimization
 - Dynamics of Machinery and Kinematics
- Total **recommended (not required)** hours per course: 60 hours

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Level 3 – Job Profile

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Contact

- Skilled designer of and expert on complex mechatronic systems
- Design, manage and improve mechatronic systems based upon customer and user needs, exhibiting “Handlungskompetenz”
- Select appropriate automation technology
- Program and troubleshoot PLC networks
- Review past system performance and carry out comprehensive system tests, with the aim of locating ways to improve operations for cost, quality, and efficiency
- Optimize existing mechatronic systems

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Benefits for Schools

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- **Mark of distinction** as a certified Siemens education partner
- Recognition as a **provider of the SMSCP Exams**
- **Collaboration opportunities** with the Siemens Technik Akademie Berlin to advance and promote Mechatronic education on a local, national, and international level.
- Access to an **international network** of Mechatronic and advanced technology educators and industry partners.
- **Flexible implementation:** opportunity to deliver and implement the program in many ways – evening-, weekend-, part-time-, full-time-program



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Benefits for Teachers

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- As a Siemens-certified instructor, teachers are certified by Siemens as an **expert in the field of mechatronic education**
- Recognition as a practitioner of “System Approach”
- Professional training in teaching and learning methodology as well as subject matter expertise in mechatronic



Benefits for Students

Siemens

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- Opportunity to acquire a **world-class industry certification** in mechatronic systems without disrupting their normal studies
- **Extra advantage** over the competition on the job market



- The SMSCP is designed to **complement** and **fit** into existing programs of study, not replace them
- Students can receive **both** an industry certification **and** a school diploma
- Partner schools can offer SMSCP in a variety of formats- traditional academic, weekend, and part-time classes- allowing students and workers flexible opportunities to enhance their technical skills

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Global Partners

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WDA singapore workforce development agency

AMATROL

FESTO

v.cat vidual communication and training

intelitek

SIEMENS
Siemens SITRAIN
India, South Africa

VIRGINIA WESTERN
The Community's College

YAC

ITE College West

YAC

PURDUE UNIVERSITY

ICTI
Lehigh Career & Technical Institute

PIEDMONT Technical College

KCTCS
Kentucky Community & Technical College System

COCHISE COLLEGE

CALU

CPCC

GREENVILLE TECH

SPARTANBURG COMMUNITY COLLEGE

Motlow State Community College

Support materials

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- Partner Schools have access to an extensive **library** of course support materials
- Course support material is distributed as a program benefit to our partners via **VCAT**, our E-Learning and communications platform
- Partner schools and teachers use course support materials to create and **deliver** Siemens Mechatronic Systems Certification Program **courses** locally
- Course exams are conducted via VCAT



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Siemens Professional Education

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www.technik-akademie.de



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Examples of **SMSCP-related** Job Opportunities: Advanced Manufacturing (I)

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Level I

Machine Operator

- Set up and operate machines.
- Observe machine operation to detect work piece defects or machine malfunctions, adjusting machines as necessary.
- Read blueprints or job orders to determine product specifications, tooling instructions, and operational sequences.
- May perform minor machine maintenance such as oiling and cleaning machines.
- Alert supervisor if major repairs/servicing is needed.

Level II

Electro-Mechanical Technician

- Test performance of electro-mechanical assemblies using testing devices such as volt meters.
- Analyze and record test results, and prepare written documentation.
- Read blueprints, schematics, diagrams, and technical orders to determine methods and sequences of assembly.
- Install electrical and electronic parts.
- Repair, rework, and calibrate hydraulic and pneumatic systems to meet operational specifications and tolerances.
- Install and maintenance of robots.

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Examples for Job Opportunities: Advanced Manufacturing (II)



Level I Entry-Level Industrial Maintenance Technician

- Tend to and observe equipment and machinery to verify efficient and safe operations.
- Examine and test machinery and components for defects.
- Clean and maintain machinery, equipment, and tools.
- Disassemble broken and defective equipment to facilitate repair and reassemble when repairs are complete.
- Provide assistance to more skilled technicians in the repair and maintenance of machines.

Level II Industrial Maintenance Mechanic/ Technician

- Repair and replace broken or malfunctioning components of machinery and equipment.
- Repair and maintain the operating condition of industrial production and processing machinery and equipment.
- Observe and test the operation of machinery and equipment in order to diagnose malfunctions, using voltmeters and other testing devices.
- Analyze test results, machine error messages, and information obtained from operators in order to diagnose equipment problems.

Examples for Job Opportunities: Green Energy

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Level I Wind Farm Facility Operator

- Operate the generation and transmission system within the normal and emergency limits.
- Change loading of generators as required by the power control system.
- Proactively monitor, control, evaluate and ensure availability and production during normal and emergency conditions.
- Support and direct site personnel in the performance issues and service activities to restore system performance of turbines.

Level II Wind Turbine Service & Installation Technician

- Install, troubleshoot, and maintain the complex electricity generating systems of wind turbines.
- Install wiring and electronic equipment and test installed/serviced equipment.
- Conduct site surveys.
- Train/supervise less experienced employees on procedures, systems, and installation/service techniques.

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Examples for Job Opportunities: Energy Power Plant

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Level I Power Plant Operator

- Help operate electrical power plants.
- Read, interpret, and adjust meters and system controls to ensure turbines or grids are operating appropriately.
- Change loading of turbines/generators as required by the power control system.
- May perform routine and preventive maintenance.
- May install or service equipment while under supervision.

Level II Power Plant Systems Technician

- Adjust and troubleshoot precision electronic pneumatic instrumentation, process controllers, and process control loop components.
- Handle large-scale installations of new equipment independently or in teams.
- Respond to unexpected breakdowns of equipment and handle major repair operations.
- Ensure the efficient operation of the power generation system.

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Examples for Job Opportunities: Building Technologies

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Level I Building Maintenance Technician

- Perform routine preventive maintenance to ensure that machines continue to run smoothly, building systems operate efficiently, or the physical condition of buildings does not deteriorate.
- Assemble, install or repair wiring, electrical and electronic components, pipe systems and plumbing, machinery, and equipment.
- May diagnose mechanical problems and determine how to correct them, checking blueprints, repair manuals, and parts catalogs as necessary.
- May inspect, operate, and test machinery and equipment to diagnose machine malfunctions.

Level II Field Service Technician

- Install, test, and troubleshoot security, energy, and communication systems.
- Repair and resolve problems with systems' network.
- Remove and repair defective modules.
- Conduct site visits to analyze customer's building technology needs. Provide technical support to customers and onsite staff.

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