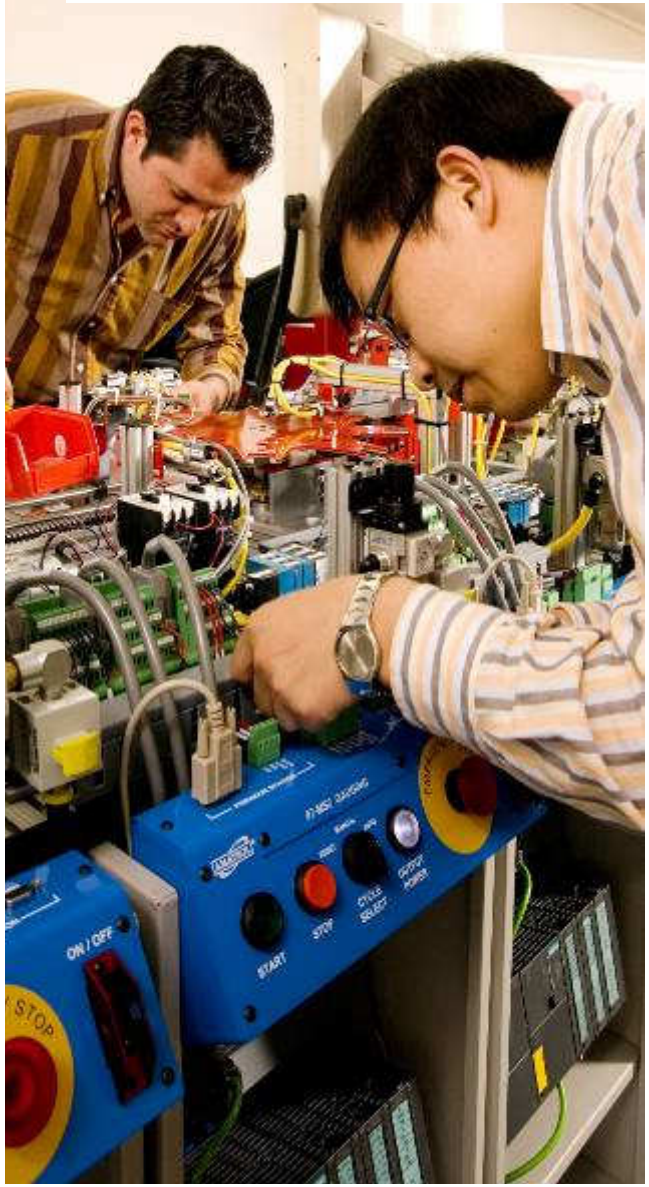


SIEMENS

Siemens Mechatronic Systems Certification Program (SMSCP)

Siemens and Technical Education

Siemens AG

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

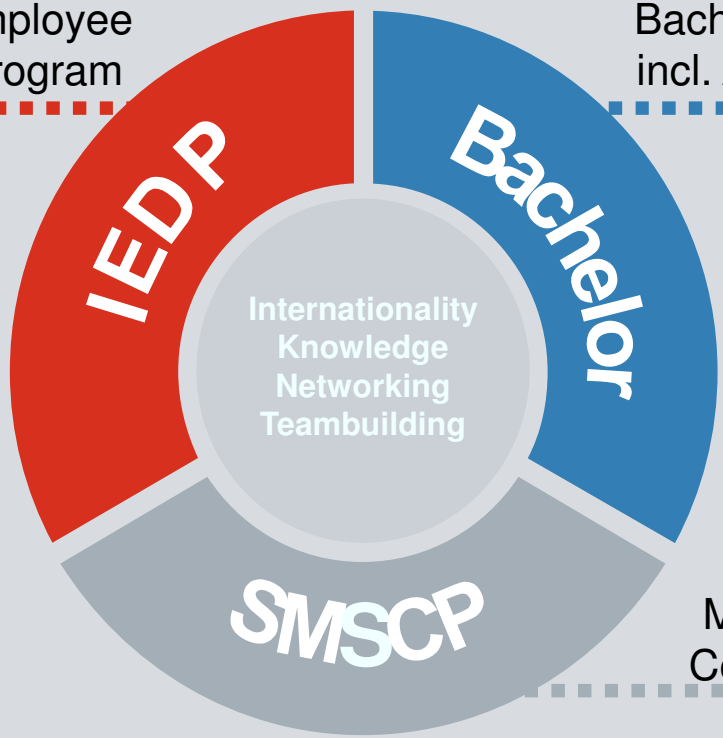
Its training approach is grounded in the renowned German system of technical education. Their special teaching and learning approach is the result of long experience with technical programs in international contexts to develop

„**Handlungskompetenz**“.

Siemens Technik Akademie Berlin

International Employee Development Program

Bachelor of Engineering incl. Associate Engineer



Specialized Expertise:

- SPS / Lean
- Smart Systems for Infrastructure

Siemens Mechatronic System Certification Program

Siemens Mechatronic Systems Certification Program

Siemens Technik Akademie Berlin - SMSCP Connection

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Siemens Technik Akademie Berlin

Mechatronic Systems Associate Engineer Program

First 2 years of the Bachelor of Engineering Program

System Approach Teaching Methods

Mechatronics Subject Areas

Integration of Hands-On Learning in the Classroom

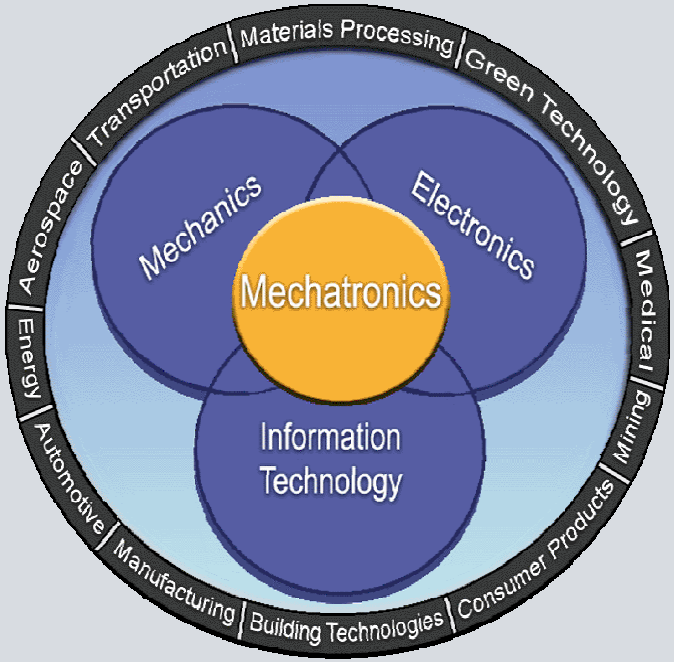
System Focused Troubleshooting/ Problem-Solving Skills

Siemens Mechatronic System Certification Program

Using key concepts from the STA-Berlins Associate Engineer Program in Mechatronic Systems, SMSCP creates an educational program that colleges and universities around world use to strengthen their students technical skills.

Mechatronics

Mechatronics is the synergistic integration of mechanics, electronics, control and systems theory, and computers into a complex, single system used within production and manufacturing, in order to improve and/or optimize its efficiency, productivity, and quality.



Mechatronics- Related Technical Fields

- Automation Technology
- Robotics Technology
- Industrial Maintenance
- Process and Controls
- Electro-Mechanical Technology

Siemens Mechatronic Systems Certification Program (SMSCP)

SIEMENS

- 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“

SIEMENS

Why SMSCP?

Adaptable Expertise

- bringing together the core expertise of the STA-Berlin (mechatronics and automation technology), SMSCP offers a highly adaptable technical education program that can be easily implemented in a variety of education environments.

Well-Trained, Skilled Technical Workers

- With its emphasis on in- demand industrial skills, troubleshooting, and hands-on practical training, SMSCP helps to create knowledgeable technical workers than can work in a variety of production, technician, and engineering roles.

Education and Training Cost-Savings

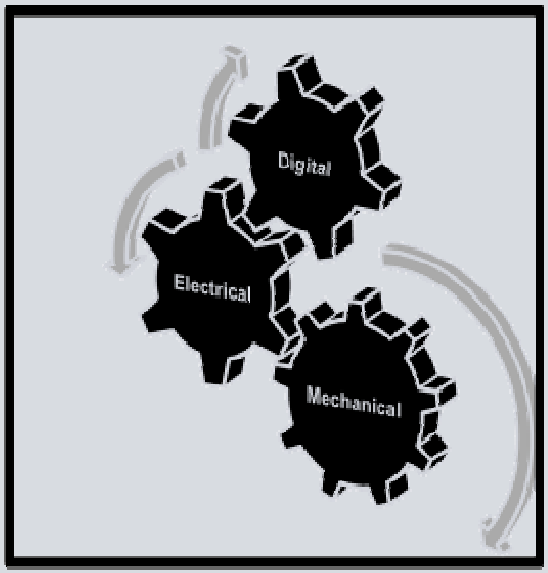
- With SMSCP, companies and industries can receive qualified workers at a much lower cost by utilizing local and/or existing educational and training resources.

SMSCP and System Approach: Holistic, Hands-On Mechatronic Education

SIEMENS

With its system focus and holistic learning model, 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 Inter-relationships and How They Drive System Function Together
- Comprehensive Troubleshooting & Systems Analysis



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

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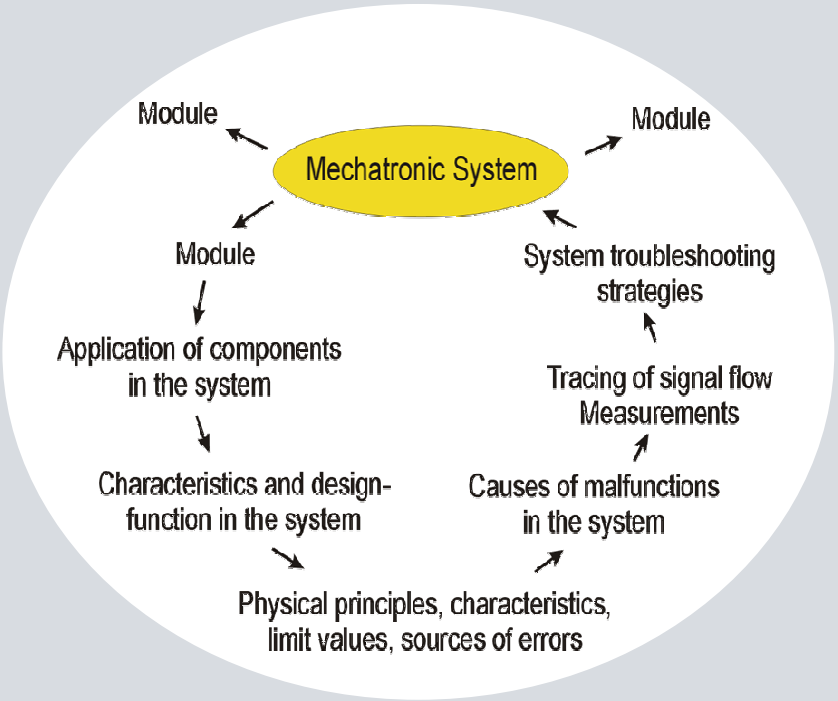
Students learn about the complexities of the system in a holistic fashion



Ability to transfer their knowledge to another system *„Handlungs-kompetenz“*

Start at macro level

Ability to pinpoint malfunctions

Then focus on: -System modules - Components
- Physical properties - Measurements

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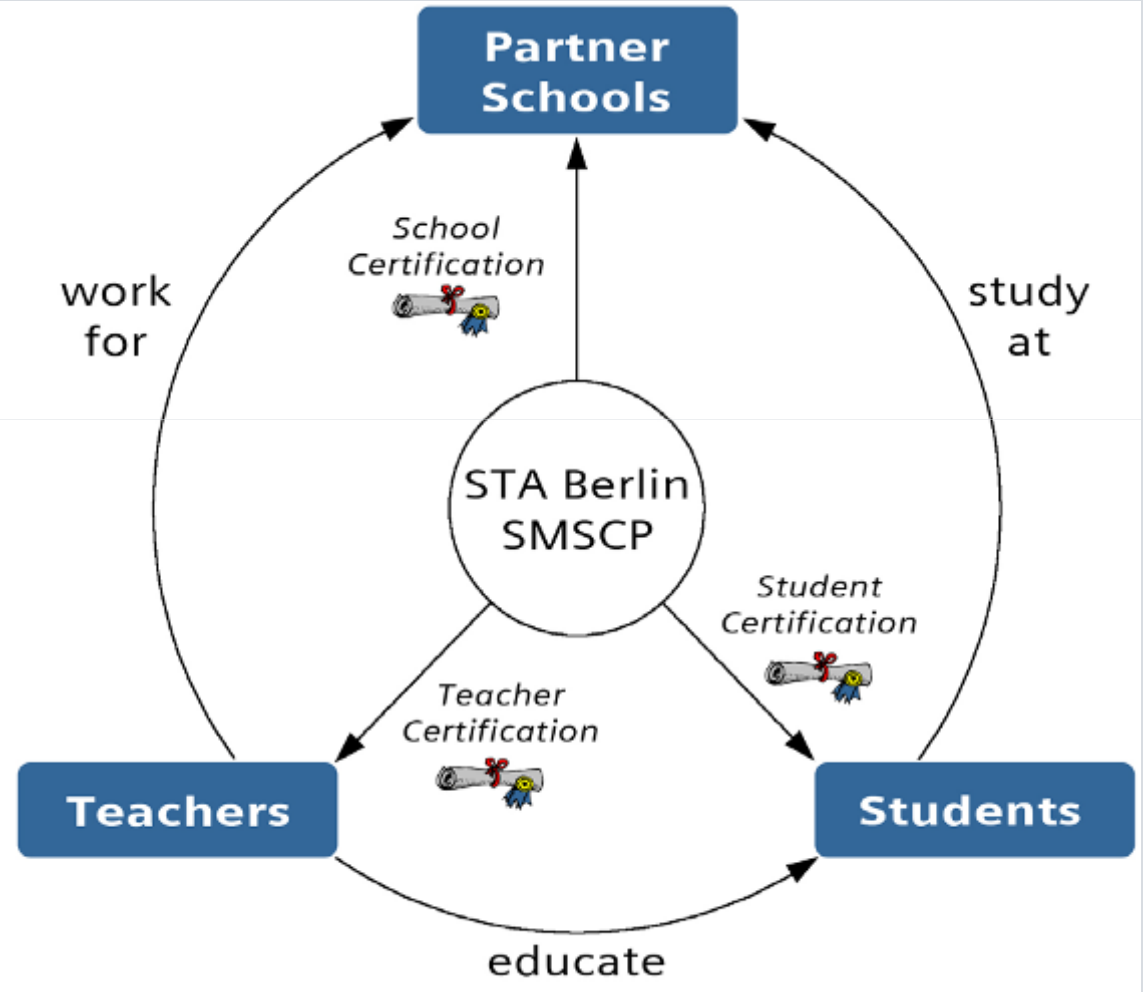
SMSCP Certification Process



1st step: Instructor Certification

Goal:

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

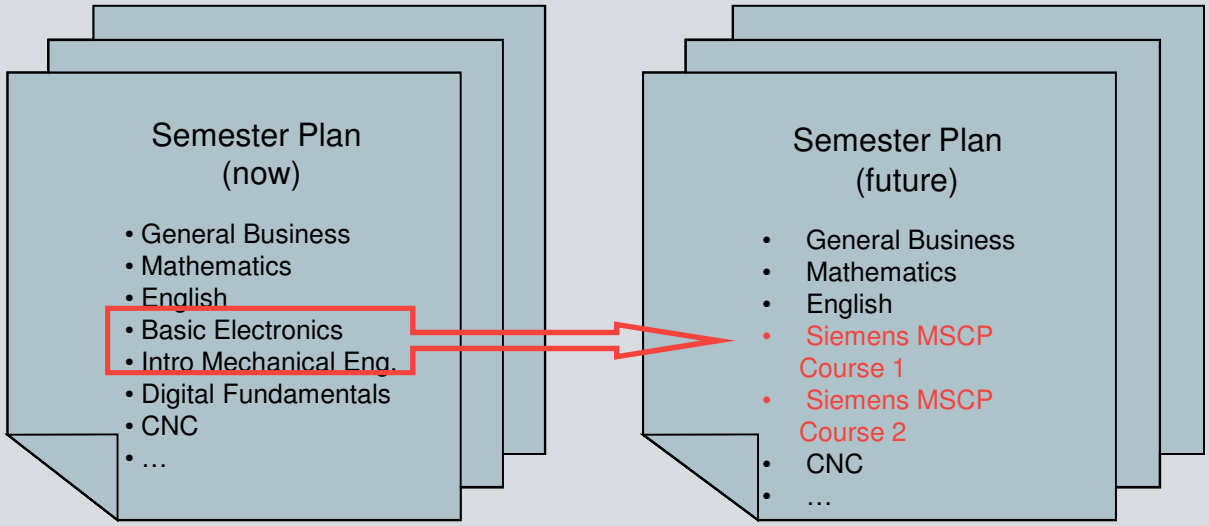
Content and Structure of the Instructor Certification Course:

- System Approach teaching method
- Learning and practicing how to use the System Approach teaching method in the field of mechatronic education
- 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

2nd step: Implementation at the Partner School

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

Goal:
To prepare students well for the working environment and give them an extra advantage over the competition on the job market with the opportunity to receive **both** an industry certification **and** a school diploma.

Two 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.

Program requirements

- 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

Vision and Mission

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.

Timeline

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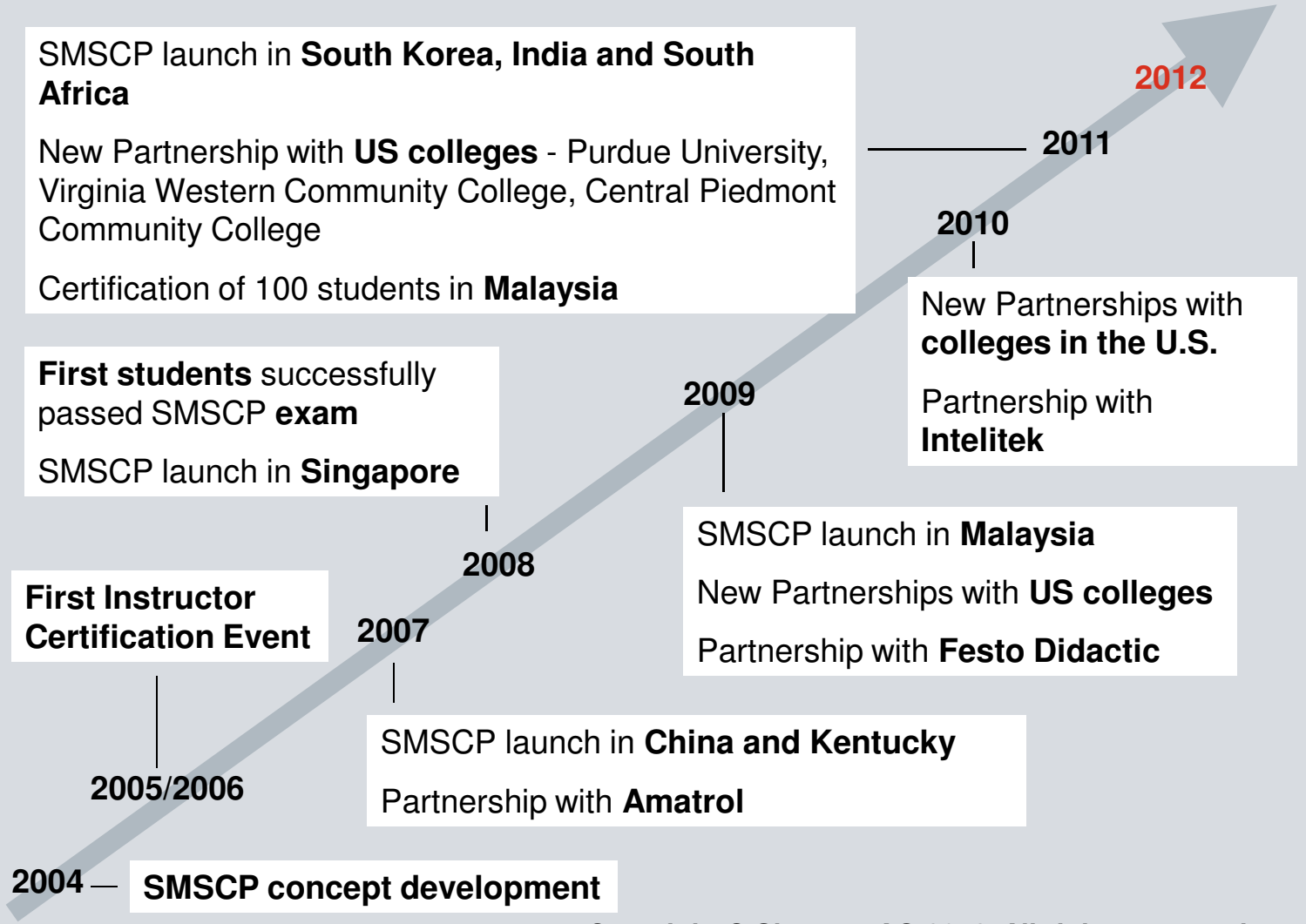

Level 1 –
Siemens Certified Mechatronic Systems Assistant

SIEMENS

- Intelligent machine operator with **„Handlungskompetenz“**
- Emphasis on efficient operation and troubleshooting
- Four courses à ca. 60 hours cover:
  - Electrical Components
  - Mechanical Components and Electric Drives
  - (Electro) Pneumatic and Hydraulic Circuits
  - Digital Fundamentals and PLCs
- Total duration: 240 hours or about 6 weeks (full time course)

Level 1 – Job Profile

SIEMENS

- 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

Level 2 – Siemens Certified Mechatronic Systems Associate

SIEMENS

- Technician-level worker with **„Handlungskompetenz"**
- Recommended: significant project work connected to process management
- Six courses à ca. 60 hours cover:
  - Process control technologies
  - Introduction to Totally Integrated Automation
  - Automation systems
  - Motor control
  - Mechanics and machine elements
  - Manufacturing processes
- Total duration: 360 hours or about 9 weeks (full time course)

Level 2 – Job Profile

SIEMENS

- 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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Benefits for Students

- Opportunity to acquire a **world-class industry certification** in mechatronic systems without disrupting your 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
- Multiple implementation possibilities, for example: evening, weekend, skills retraining, accelerated, etc.

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Benefits for Teachers

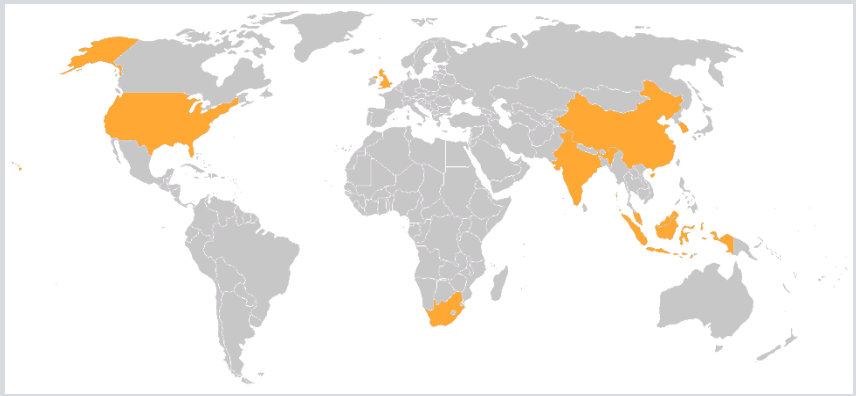
- Teachers are certified by Siemens as an **expert in the field of mechatronic education – SMSCP Certified Instructor**
- Certified Instructors have completed the Instructor Certification Program at the Siemens Technik Akademie Berlin
- Comprises the general teaching and learning approach course as well as the course-specific curriculum
- Recognized practitioner of “System Approach”

SIEMENS

Benefits for Schools

- **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

Global Partners



Siemens SITRAIN
India, South Africa, China

Support Materials

- 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

Contact

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Siemens Mechatronic Systems Certification Program

Implementation Model

SIEMENS

- **Partner College: Central Piedmont Community College**
- **Location: Charlotte, North Carolina USA**
- **Implementation Strategy:**
  - Integration of SMSCP into Advanced Manufacturing → Mechatronics degree program (2 Year Technical Degree)
  - Students will sit for Level I Certification Exam in Year 1 and Level II Certification Exam at the end of degree program
- **Industry Connections:**
  - Education/Training Partner for Apprenticeship2000-consortium of European companies, including Siemens, who provide apprenticeship positions ín technical fields
  - Develops specific, short-term training courses for local industries‘ new and existing workings
  - Coordinates Industry Boards for the Energy and Manufacturing Sectors

Examples of Job Opportunities: Advanced Manufacturing (I)

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Level I Machine Operator	Level II Electro-Mechanical Technician
•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.	•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.

Examples of Job Opportunities: Advanced Manufacturing (II)

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Level I Entry-Level Industrial Maintenance Technician	Level II Industrial Maintenance Mechanic/ 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.	• 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

SIEMENS

Level I Wind Farm Facility Operator	Level II Wind Turbine Service & Installation Technician
• 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.	• 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.

Examples for Job Opportunities: Energy Power Plant

SIEMENS

Level I Power Plant Operator	Level II Power Plant Systems Technician
• 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.	• 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.

Examples for Job Opportunities: Building Technologies

SIEMENS

Level I Building Maintenance Technician	Level II Field Service 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.	• 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.