

Creating a Globally Competitive Workforce Through International Partnerships: The Kentucky Experience

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International Workforce Transformations

- Changing nature of the workplace and workforce demographics
- Globalization and digitization
- Rapid (accelerated) rate of change
- Challenges of an insufficient and under prepared “pipeline” of workers
- The new “soft” skills requirements – beyond problem solving and critical thinking to innovation, adaptive expertise and “berufliche Handlungs kompetenz” skills

Lessons From the U.S.

Critiques: From *The Perfect Storm* to *Tough Choices or Tough Times*

1. The **system** is obsolete
2. The education pipeline is leaking and broken
3. **All** students/workers must be well prepared for global 21st century jobs
4. The “new skills” requirements: beyond problem solving and critical thinking

Lessons (cont.)

5. Increased emphasis on soft skills, foundation skills and employability skills
6. Preparation for work *and* postsecondary education
7. Increased emphasis on standards and credentials

International Reform Efforts: The Bologna Process and the Lisbon Strategy

- Demographics and economic competitiveness
- Focus on occupationally-oriented, labor market related features
- Increase skills to match economic structure
- Create mobility of credentials and documentation recognition of knowledge and skills
- Growing need for short-cycle degrees (sub-baccalaureate)
- Contexted learning and emphasis on soft skills

Kentucky Case Studies

- TA3 Alliance
- AMTEC
- Siemens Mechatronics



Institutional and Instructional Transformations at KCTCS

- Alignment and integration:
 - Incorporate understanding of globalization and cultural diversity
 - Align and connect company training requirements with college courses
 - Modularize courses/fractional credit/ dual credit/Corporate Colleges
 - Eliminate internal silos (mission integration)
 - Non-traditional delivery (blended learning, simulation, evening and weekend classes, business on-site classes)

Transformations (cont.)

- Learner-centered, innovative instruction
- Multiple entry/exit points
- Embedded certificates
- Adaptive expertise (reducing cycle time of learning)
- Infusion of 3D virtual reality, simulation-based learning into curricula

Creating International Alliances That Work

The Role of the Trans-Atlantic Technology and Training Alliance (TA3)

Focus on strategic partnerships and learning alliances around projects/clusters (IT, Technical Training, Auto Manufacturing, CraftNet)

Automotive Manufacturing Technical Education Collaborative (AMTEC)

Supported by:

National Science Foundation



- Advanced Technical Education

US Dept. of Labor/ETA

- High Growth Job Training Initiative (HGJTI)

Private Industry – All Global Companies – seek workforce skills consistency everywhere they operate

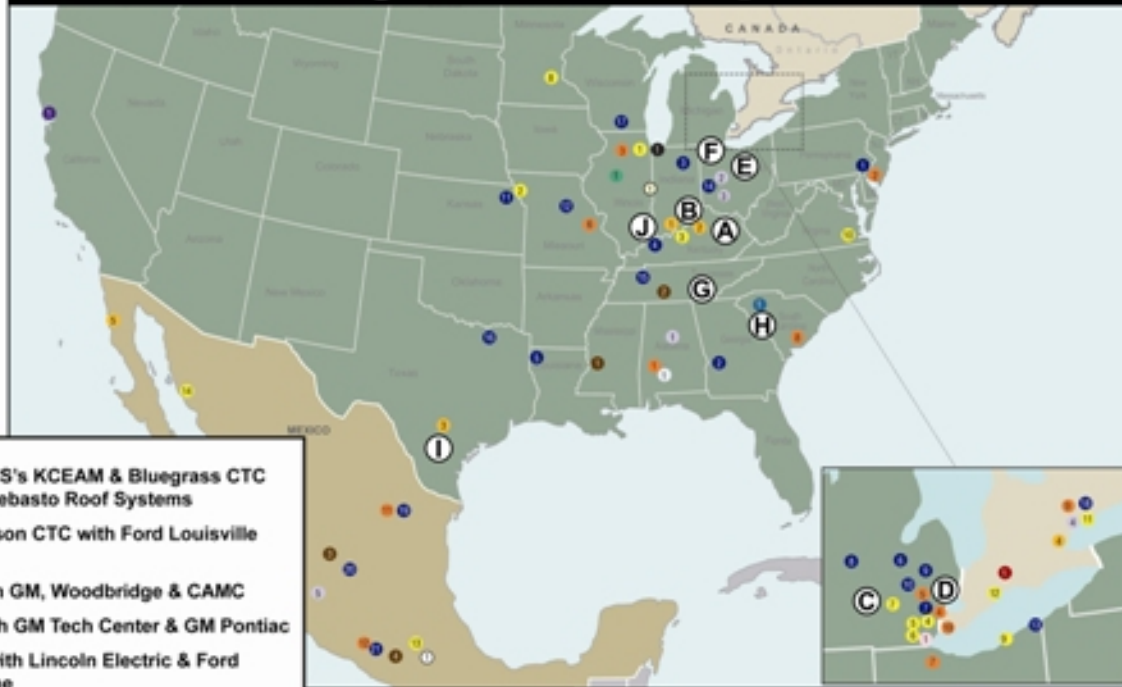
- Toyota Motor Manufacturing
- Ford
- BMW
- General Motors
- Tier 1 and 2 Suppliers

AMTEC Membership and Purpose

- 8 states, 25 community and technical colleges and 29 automotive manufacturers and suppliers
- Align and standardize existing courses with industry need
- Use multi-state partnership to reduce training costs
- Promote articulation between secondary, 2-year and 4-year
- Serve as state-of-the-art teaching and learning centers for skilled trades and related faculty

AMTEC Partners and Suppliers

AMTEC Partner Locations & North America Car and Light-Truck Assembly Plants

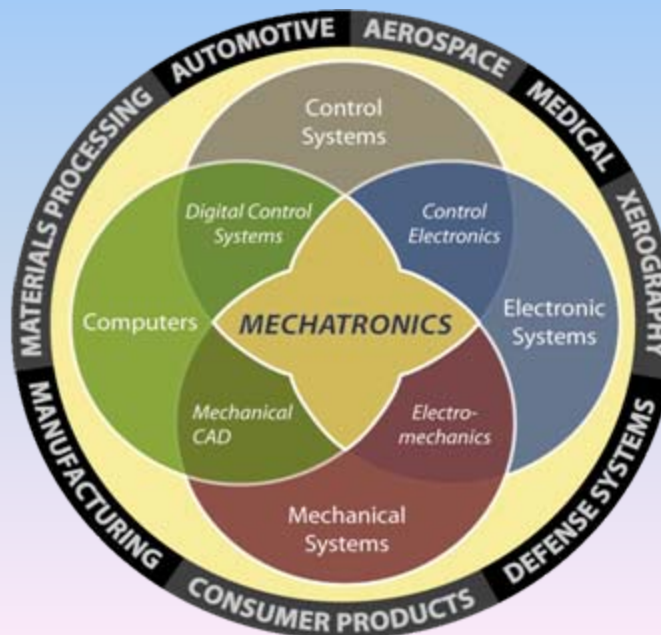


- A) AMTEC & KCTCS's KCEAM & Bluegrass CTC with TMMK & Webasto Roof Systems
- B) KCTCS's Jefferson CTC with Ford Louisville (2 plants)
- C) Lansing CC with GM, Woodbridge & CAMC
- D) Macomb CC with GM Tech Center & GM Pontiac
- E) Cuyahoga CC with Lincoln Electric & Ford Cleveland Engine
- F) Owens CC with Ford Lima Engine Plant & Rieter Automotive
- G) Pellissippi State Tech CC with PBR Knoxville
- H) Spartanburg CC with BMW
- I) Alamo Com College District with TMMTX & AVANZAR
- J) Ivy Tech Evansville & Vincennes U. with TMMI

The Siemens Mechatronics Certification Program

What is Mechatronics?

- A design philosophy that utilizes a synergistic integration of mechanics, electronics, control systems, and computer technology, to produce enhanced products, processes or systems.



Foundational Assumptions for the Partnership with the Siemens Mechatronics Certification Program— Siemens Perspective

- Significant Changes in Personnel Profile
 - 1998: 460,000 employees worldwide, 50% in Germany
 - 2008: 450,000 employees worldwide, only 1/3 in Germany
- Importance of Worldwide Standards for Manufacturing and Planning
- Too expensive to have employees doing only one task!
 - Training and recruiting of multi-skilled workers more important
 - Adaptability to new situations: *Handlungskompetenz*
- Future challenge for Siemens to retain and expand international focus (190 countries)
- Private companies in Germany are expected to invest heavily in education—by need and by tradition

Foundational Assumptions for the Partnership with the Siemens Mechatronics Certification Program— KCTCS Perspective

- Growing Need for Multi-Skilled Technicians (Skills Gap)
- Rapid Changes in Technology
- Reduce Cycle Time of Learning
- Increasing Emphasis on Soft Skills
- From Problem Solving and Critical Thinking to:
 - Adaptive Expertise/Hyper-Human Skills
 - *Handlungskompetenz*
- Need for Industry – Recognized Credentials
- Intra- and International Collaboration/Partnership/Standards

The Siemens Mechatronics Certification Program

- Integrated System Approach

- System as Focal Point

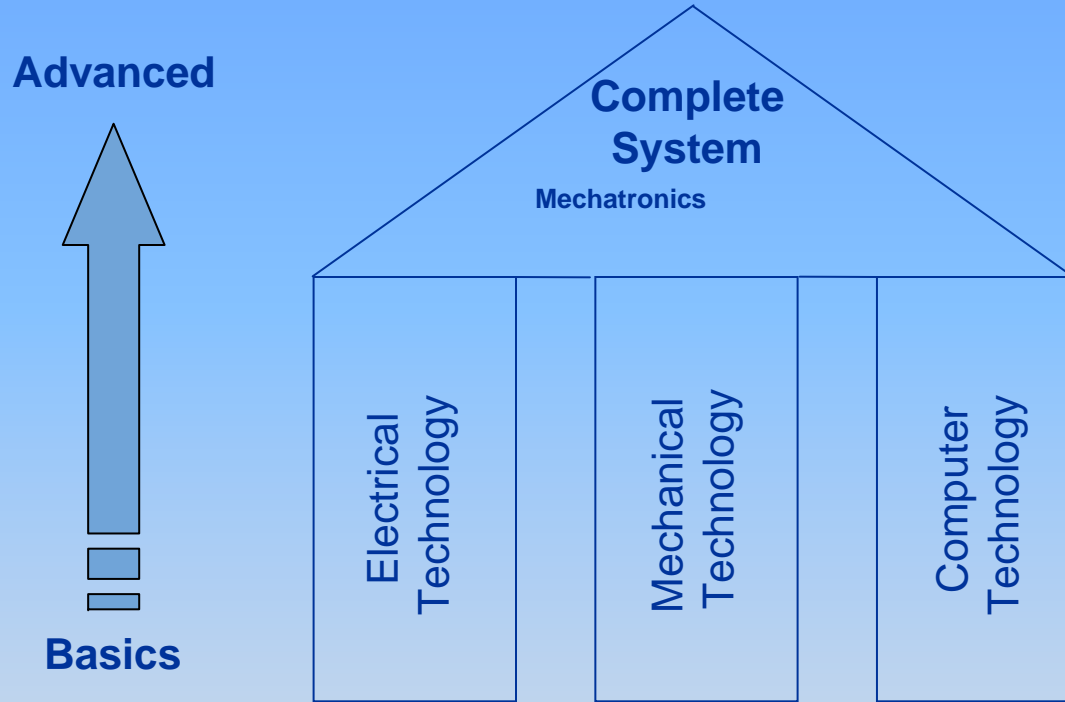
- Closed Loop Learning

- Creating a Comprehensive Process – Oriented Way of Learning

- Goal

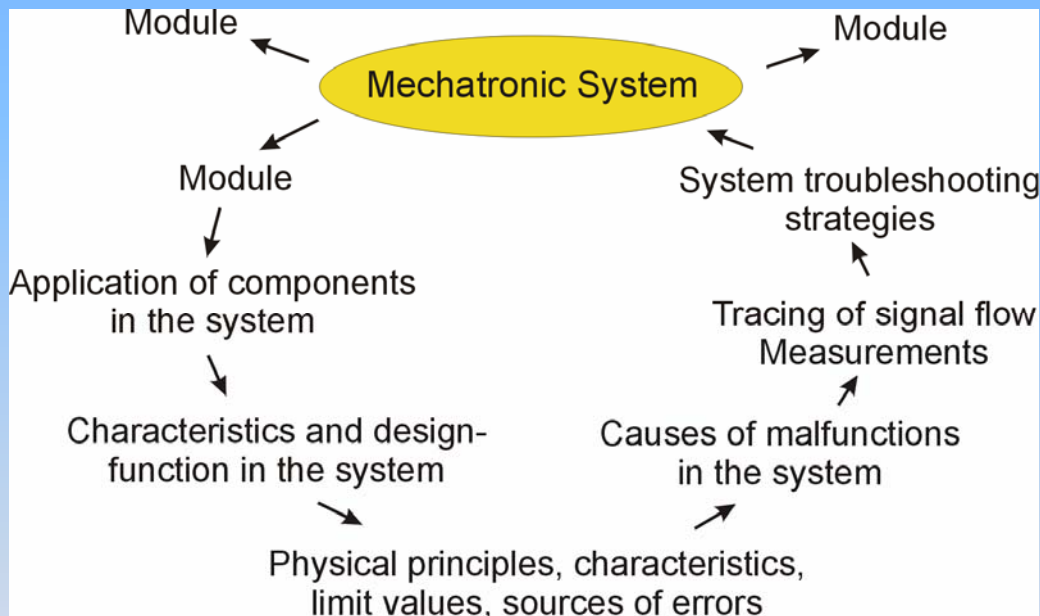
- Handlungskompetenter Facharbeiter selbständig flexibel fähig sich zügig in neue Situationen einzuarbeiten.

Traditional Approach to Mechatronics Education



**Each of the three areas taught in isolation.
Synthesis is the last step!!**

System Approach - The Chance to Create a Comprehensive Process Orientated Way of Learning



- ✓ **Customer Presentation**
- ✓ **Preventive Maintenance**
- ✓ **Project Management**
- ✓ **Cost Controlling**
- ✓ **Internet – Teamwork**
- ✓ **Process Optimization**

Siemens Mechatronic Systems Certification Program

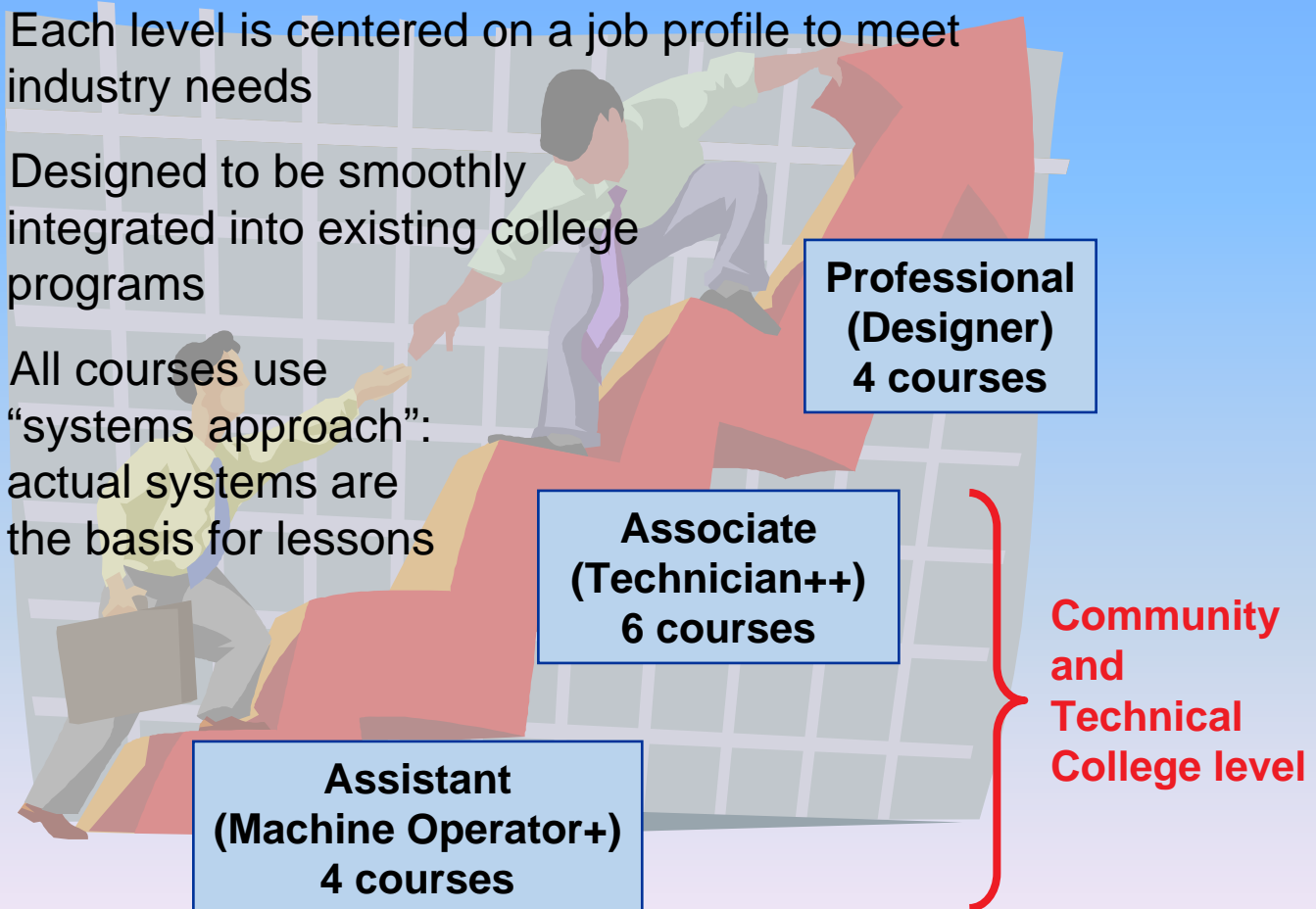
- Siemens industry certification in mechatronic systems for *instructors and students*
- Comprehensive skills certification offered in three levels, not a product certification
- Delivered together with partner schools
- Consistent standards of achievement worldwide
- Verified through certification examinations

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



Siemens Mechatronic Systems Certification Program

- Each level is centered on a job profile to meet industry needs
- Designed to be smoothly integrated into existing college programs
- All courses use “systems approach”: actual systems are the basis for lessons



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