Re-access and Modify Manufacturing Engineering Curriculum to Meet the Requirements of Industry 4.0

David Ding, PhD
Program Director – Manufacturing Engineering
John Dzissah, PhD
Chair – Operations and Management Department
Charles Bomar, PhD
Dean - College of Science, Technology, Engineering, Mathematics and Management

Presentation Overview

- Industrial 4.0
- Overview of the current UW – Stout Manufacturing Engineering program
- Case/project study – Determine and Gaps between the current program curriculum and the needs of industry
- Changes and opportunities
Industrial 4.0

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Industrial 4.0

- Industrial 4.0 – Germany
- Produce in China 2025
- NNMI – American Make
**Industrial 4.0**

- Replacing human work – System-based Automation
- Higher level of Human-Machine collaboration such as remote (long distance) control of production equipment
- Usage of cloud-computing and big data to optimize production, such as computer-based manufacturing system simulation
- Use of sensors to monitor/control equipment
- Paperless logistics
- Creation of new jobs for high skilled workers
- Increased individual flexibility (for both product and operations)

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**Current UW – Stout MFGE Program Curriculum**

- ABET Accredited
- A comprehensive degree which incorporates aspects of many other engineering disciplines; such as, mechanical, industrial, electrical and materials science.
- Placement Rate of 100%
- Average starting salary around $60,000 (2015-2016 class).
A Case Study – Lee Kum Kee
A Case Study – Lee Kum Kee

• **Challenge:**
  • The Koji is the process bottleneck, time, quality and yield.

A Case Study – Lee Kum Kee

• **Solution:**
  • Transformation of collaboration
  • Cyber-physical production systems
  • Connection between virtual and real world
  • Processes
  • Embedded systems
  • Software components, which are integrated in machines
  • Production adjustments do not based on the commands from a central computer, but rather from a product
A Case Study – Lee Kum Kee
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- Results
  - Energy consumption reduced to 20%
  - Yields increased from 80% to 98%
  - Cycle time reduced by 60%
  - Reduced labor cost
  - Higher quality with more customization options
Changes and Opportunities

- Contents required by Industry 4.0
  - Big Data related content
  - Cyber security
  - Network and Programming
  - System based automation

Changes and Opportunities

- Plan for changes
  - Eliminate/reduce credit hours for traditional manufacture engineering courses.
  - Create new courses that covers the content required by Industrial 4.0
  - Professional Certifications
Changes and Opportunities

- Challenges
  - Program accreditation requirements
  - General Education requirements
  - Faculty professional development
  - Online delivery
  - Education 4.0

Summary

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