

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

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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



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Industrial 4.0

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



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Industrial 4.0

- Replacing human work – Systembased 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 computerbased 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)



Current UW – Stout MFGE Program Curriculum

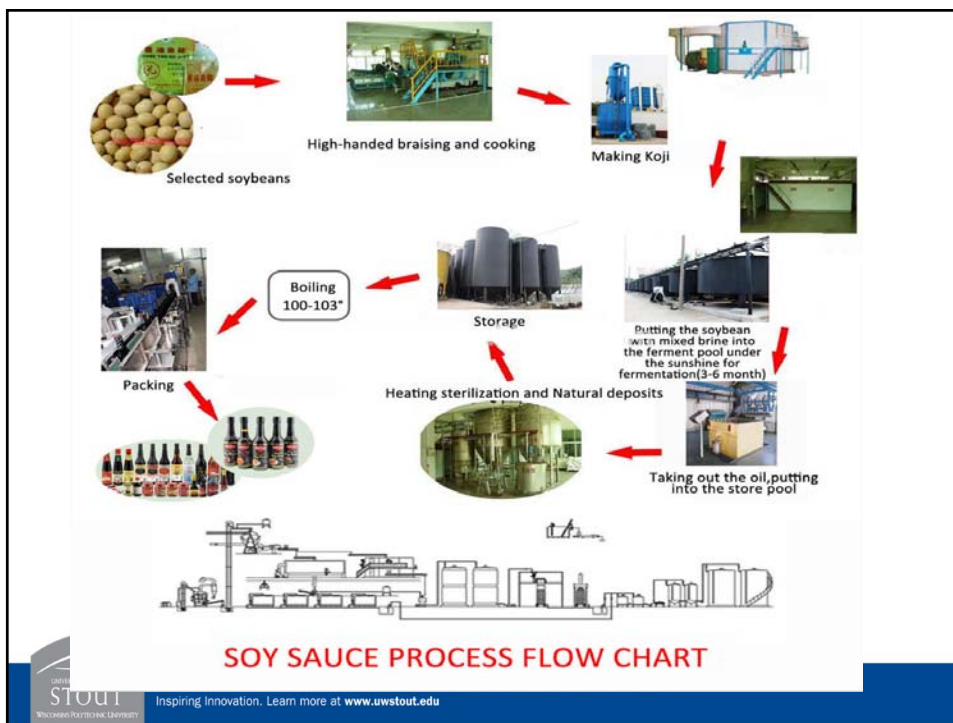
- ABET Accredited
- A comprehensive degree which incorporates aspects of many other engineering disciplines; such as, mechanical, industrial, electrical and materials science.
- Placement Rate of 100%
- Average starting salary around \$60,000 (2015-2016 class).



A Case Study – Lee Kum Kee



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A Case Study – Lee Kum Kee

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



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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



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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



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Changes and Opportunities

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



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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



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Changes and Opportunities

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



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