Webinar Logistics

- Please mute your phone line. If you are unable to manually mute your line, press *6 and your line will be muted.

- If you have a question, you can raise or lower your hand by clicking the Raise Hand icon and selecting Raise Hand from the drop down menu at the top of your screen.

- Please change your information to your full name and state by clicking on the Attendee List drop down and selecting ‘Edit My Info’.

- All questions will be addressed following the presentation.

- We would like to remind everyone that this call is being recorded and will be available on The Manufacturing Institute website shortly following the webinar.
Aligning and Mapping Programs of Study to Certifications

Community of Learners, March 2012
Agenda

- Welcome
  - Jennifer McNelly, President, The Manufacturing Institute
- Critical Components of Success
- Aligning and Mapping Certifications in Programs of Study
  - Kelly Zelesnik, Dean, Engineering Technologies
  - Professor Tom Annable, Manufacturing Engineering Technologies
  - Mr. Larry Waller, Instructor
- Question and Answer
- 2012 Schedule of Webinars
Peer-to-Peer Technical Assistance

January, 2012, survey results:

- Sites have done considerable work on research and design elements
- Emphasis now is on moving to action
- Field is requesting more “how-to” tools
- Sites want to access peer knowledge and expertise
Critical Components of Success

Key Areas for Action:

- Planning and Research
- Design and Development
- Implementation
- Continuous Improvement
Critical Components of Success

Implementation

1. Audit Programs of Study
2. Align and Map Certifications to Programs
3. Align to STEM
4. Assess Faculty and Implement Professional Development
5. Develop Certification Partnerships
6. Deploy Dream It. Do It. & Student Recruitment Strategies
7. Develop Feeder Systems
Audit Programs of Study

- Determine which programs of study to target for initial certification efforts
- Analyze the curriculum in those programs of study against the requirements of targeted industry certifications
Align and Map Certifications to Programs of Study

- Identify and/or develop new instructional modules to fill identified gaps in curriculum
- Determine where in the sequence of instruction the various certification exams should be given
Aligning and Mapping Industry Certifications to Programs of Study

Kelly Zelesnik, Dean, Engineering Technologies

Professor Tom Annable, Manufacturing Engineering Technologies

Mr. Larry Waller, Instructor
Overview

- Context and commitment at Lorain
- Using data to select targeted programs
- Overview of alignment process
- Description of alignment process and outcomes for four NAM-endorsed certifications
- Role of employers in process
- Current career pathways
- Lessons learned
Lorain County Community College, an innovative leader in **education, economic, community and cultural development**, serves as a regional catalyst for change in a global environment through accessible and affordable academic and career-oriented education, lifelong learning and community partnerships.
Unique Infrastructure and Partnerships Facilitate Engagement and Collaboration

- University Partnership: bachelors’ & masters’ degrees offered onsite
  - First Advanced Technologies Center in Ohio
  - Member of National Coalition of Advanced Technology Centers
  - NSF National Center for Welding Education & Training (Weld-Ed)
Manufacturing is a major economic driver in the region

- Cleveland Metropolitan Statistical Area (MSA) = Cuyahoga, Geauga, Lake, Lorain, and Medina County
- 4,046 companies
- 123,265 workers (10% of all jobs)
- Average wage of $42,016
- Manufacturing jobs are good, family-wage jobs
Manufacturing supports 18% of all jobs
Manufacturing Challenges and Opportunities

All Manufacturing 2007-2012

<table>
<thead>
<tr>
<th>Description</th>
<th>2005 Jobs</th>
<th>2012 Jobs</th>
<th>Change</th>
<th>% Change</th>
<th>Current EPW</th>
<th>2009 Establishments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Total</td>
<td>152,849</td>
<td>111,916</td>
<td>-40,933</td>
<td>-27%</td>
<td>$65,440</td>
<td>4,046</td>
</tr>
<tr>
<td>State Total</td>
<td>831,808</td>
<td>615,324</td>
<td>-216,484</td>
<td>-26%</td>
<td>$63,524</td>
<td>17,199</td>
</tr>
<tr>
<td>National Total</td>
<td>14,710,160</td>
<td>12,045,507</td>
<td>-2,664,653</td>
<td>-18%</td>
<td>$67,354</td>
<td>367,814</td>
</tr>
</tbody>
</table>

Source: EMSI Complete Employment - 2nd Quarter 2010
Manufacturing Workforce: Implications of Change

Production Occupations 2010-2012

- 2010 Jobs: 90,728
- 2012 Jobs: 83,801
- Change: -6,927
- Replacement: 10,615
- 2010-2012 Openings: 3,688
Manufacturing Jobs Require Higher Skills

Manufacturing Employment by Skill Group, 2003 through 2010

Index 2003=100

## Demand for Skilled Manufacturing Workers

*The data highlight total demand for these high-skilled workers across all industries. Two-year demand includes new and replacement workers.*

<table>
<thead>
<tr>
<th>SOC Code</th>
<th>Description</th>
<th>2010 Jobs</th>
<th>2012 Jobs</th>
<th>2-year Demand</th>
<th>Average Hourly Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-2092</td>
<td>Team assemblers</td>
<td>8,092</td>
<td>7,398</td>
<td>364</td>
<td>$13.88</td>
</tr>
<tr>
<td>51-2099</td>
<td>Assemblers and fabricators, all other</td>
<td>4,458</td>
<td>3,995</td>
<td>207</td>
<td>$18.35</td>
</tr>
<tr>
<td>51-4041</td>
<td>Machinists</td>
<td>7,640</td>
<td>7,017</td>
<td>202</td>
<td>$18.47</td>
</tr>
<tr>
<td>51-4121</td>
<td>Welders, cutters, solderers, and brazers</td>
<td>2,405</td>
<td>2,251</td>
<td>153</td>
<td>$17.06</td>
</tr>
<tr>
<td>51-4031</td>
<td>Cutting, punching, and press machine setters, operators, and tenders, metal and plastic</td>
<td>3,658</td>
<td>3,215</td>
<td>145</td>
<td>$14.27</td>
</tr>
<tr>
<td>51-9061</td>
<td>Inspectors, testers, sorters, samplers, and weighers</td>
<td>4,272</td>
<td>3,957</td>
<td>143</td>
<td>$16.97</td>
</tr>
<tr>
<td>51-4011</td>
<td>Computer-controlled machine tool operators, metal and plastic</td>
<td>2,688</td>
<td>2,504</td>
<td>107</td>
<td>$17.81</td>
</tr>
<tr>
<td>51-9023</td>
<td>Mixing and blending machine setters, operators, and tenders</td>
<td>1,627</td>
<td>1,588</td>
<td>80</td>
<td>$16.92</td>
</tr>
<tr>
<td>51-4072</td>
<td>Molding, coremaking, and casting machine setters, operators, and tenders, metal and plastic</td>
<td>1,724</td>
<td>1,587</td>
<td>75</td>
<td>$17.92</td>
</tr>
<tr>
<td>51-4122</td>
<td>Welding, soldering, and brazing machine setters, operators, and tenders</td>
<td>1,161</td>
<td>1,043</td>
<td>74</td>
<td>$18.37</td>
</tr>
</tbody>
</table>
# Regional Demand for Skilled Manufacturing Associates Degree

<table>
<thead>
<tr>
<th>SOC Code</th>
<th>Description</th>
<th>2010 Jobs</th>
<th>2012 Jobs</th>
<th>2-year Demand</th>
<th>Current Hourly Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-4021</td>
<td>Biological technicians</td>
<td>652</td>
<td>674</td>
<td>67</td>
<td>$17.52</td>
</tr>
<tr>
<td>19-4031</td>
<td>Chemical technicians</td>
<td>942</td>
<td>898</td>
<td>39</td>
<td>$20.53</td>
</tr>
<tr>
<td>17-3023</td>
<td>Electrical and electronic engineering technicians</td>
<td>783</td>
<td>748</td>
<td>30</td>
<td>$25.25</td>
</tr>
<tr>
<td>17-3026</td>
<td>Industrial engineering technicians</td>
<td>723</td>
<td>683</td>
<td>27</td>
<td>$22.20</td>
</tr>
<tr>
<td>17-3029</td>
<td>Engineering technicians, except drafters, all other</td>
<td>634</td>
<td>612</td>
<td>24</td>
<td>$31.63</td>
</tr>
<tr>
<td>17-3022</td>
<td>Civil engineering technicians</td>
<td>371</td>
<td>378</td>
<td>21</td>
<td>$22.77</td>
</tr>
</tbody>
</table>

*The data highlight total demand for these high-skilled workers across all industries. Two-year demand includes new and replacement workers.*
## Regional demand for skilled manufacturing workers - Bachelors Degree

<table>
<thead>
<tr>
<th>SOC Code</th>
<th>Description</th>
<th>2010 Jobs</th>
<th>2012 Jobs</th>
<th>2-year Demand</th>
<th>Current Hourly Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-2141</td>
<td>Mechanical engineers</td>
<td>2,831</td>
<td>2,687</td>
<td>145</td>
<td>$33.80</td>
</tr>
<tr>
<td>17-2112</td>
<td>Industrial engineers</td>
<td>2,161</td>
<td>2,077</td>
<td>112</td>
<td>$34.25</td>
</tr>
<tr>
<td>17-2051</td>
<td>Civil engineers</td>
<td>1,469</td>
<td>1,516</td>
<td>97</td>
<td>$30.87</td>
</tr>
<tr>
<td>17-2071</td>
<td>Electrical engineers</td>
<td>980</td>
<td>941</td>
<td>45</td>
<td>$37.54</td>
</tr>
<tr>
<td>17-2011</td>
<td>Aerospace engineers</td>
<td>499</td>
<td>510</td>
<td>35</td>
<td>$54.21</td>
</tr>
<tr>
<td>17-2031</td>
<td>Biomedical engineers</td>
<td>194</td>
<td>214</td>
<td>27</td>
<td>$34.90</td>
</tr>
<tr>
<td>17-2041</td>
<td>Chemical engineers</td>
<td>413</td>
<td>397</td>
<td>21</td>
<td>$42.59</td>
</tr>
<tr>
<td>17-2131</td>
<td>Materials engineers</td>
<td>254</td>
<td>244</td>
<td>13</td>
<td>$44.31</td>
</tr>
</tbody>
</table>

*The data highlight total demand for these high-skilled workers across all emerging industries. Two-year demand includes new and replacement workers.*
Based on data, selected five program areas for alignment with industry certifications:

- Mechanical Design
- Quality
- Welding
- Machining
- Automation

Four programs of study have short-term, one-year and two-year options
Lorain County Community College

Project goals:

- Engage faculty to align current programs with NAM endorsed skills certifications
- Assess current students to determine skill baseline
- Engage employers to promote value and use of skills certifications
Overview of Process

Introduce
- MI provides orientation to faculty
- MI facilitates planning session with faculty

Design
- Faculty set priorities for implementation
- Faculty conduct analysis of curriculum based on certification requirements

Integrate
- Division holds regular meetings to report on progress
- Division tracks outcomes
Small steps, big gains:

- Began with AWS Certifications
  - Welding Technology major; Weld Ed NSF ATE
- Offer AWS Certification for Contract Training
- AWS Certifications offered informally to prepared/interested students
- Needed to determine how to embed in credit classes
Student Assessment: AWS

- Students in aligned courses given opportunity to take related assessments
- 90% achieved at least one AWS certification
- Some students required additional lab experiences to pass so….
- Create a 1 credit Review Course with certification included
National Career Readiness Certificate (NCRC)

**Student assessment: NCRC**

- Offered to all first year students in Spring, 2010 and 2012
- All students achieved at least Bronze status (majority – Gold)
- Weakest scores received in Locating Information (national norm – ACT)
- Fall 2012 – NCRC included in TECN 111, Technical Problem Solving
Manufacturing Skills Standards Council (MSSC)

- Certified Production Technician:
  - Non-credit efforts regarding MSSC through Nord Advanced Technologies Center
  - Use of staff familiar with MSSC standards to assist with cross-walk to credit courses
  - College curriculum vs. use of MSSC online
  - Challenges with MSSC (cross-cutting, non-occupational)
Manufacturing Skills Standards Council (MSSC)

- A Work in Progress…
  - Pick one major at a time
  - Perform Gap Analysis (program outcomes vs. MSSC standards)
  - Terminology Analysis
Partnership with Lorain County Joint Vocational School

- NIMS Certifications offered through LCJVS
- Course Articulations in place for 3 Courses (one to go).
Employer Engagement

Goals

- Introduce certifications & benefits to employers, individuals, region
- Solicit employer input on certification pathways
- Solicit participants to pilot certifications with incumbent workers and/or new hires
Employer Engagement

- **Session one:**
  - Review of pathways
  - Introduction of skills certification system
- **Session two:**
  - Employer testimonials
  - Review of wages in pathways
  - Recruitment of companies to pilot assessments with incumbent workers
Employer Engagement

LCCC

• Session three:
  o Final review of education, certification, and career pathways and feedback on wages
  o Review of pilot certifications with individual companies
# Aligning Education, Certification and Career Pathways

*For the Welding Industry at Lorain County Community College*

## Education Pathway

### Masters and PhD
- **Bachelor of Science / Engineering Discipline**
  - Ohio State University
  - Cleveland State University
- **Associate in Applied STEM/Science**
  - 65 Credit Hours / Two Years Full Time
  - 23 Courses
  - Day / Evening Curriculum
- **STEM Diploma Program**
  - 37 Credit Hours / One Year Full Time
  - 14 Courses
  - Day / Evening Curriculum
- **STEM Certificate Program**
  - 19 Credit Hours / One Year Part Time
  - 8 Courses

## Certification Pathway

### AWS D1.1 Multiple Processes / CWI
- ASME Section 9 / API 1104
- MSSC CPT
- NCRC

## Career Pathway

### Welding Engineer
- 10 – 15 years experience
- $30.00 to $48.00 / hour

### Welding Technician
- Manufacturing Engineering Technician
- $22.64 / hour (17-3026)

### Welder (Entry Level)
- Welder/MIG/Repair
- 3 – 5 years experience
- $13.00 to $16.00 / hour

## Employer Job Title / Wage Range

### Automation Welding Mgr.
- 10 – 15 years experience
- $30.00 to $48.00 / hour

### Welder / Fabricator
- 5 – 10 years experience
- $18.00 to $22.00 / hour

### MIG Welder / Entry Level
- 0 experience
- $10.00 / hour

## National Career Readiness Certificate

- Personal Effectiveness
- Academic Competencies
- Workplace Competencies

### Key Links

- Applied STEM (High School) - Career Academy - Youth Development Programs
- Out of School / Low Skill Youth / Adults - WIA / Career Centers - ESL / VESL - GED / ABE “Bridge” and Foundation Programs
- Skilled Adults - Retraining / Lay Offs – Continuing Education Company Specific Apprenticeship
Employer Engagement

Outcomes

• Observations & challenges in filling entry level positions
• Validation of certification pathways and corresponding wage range & experience requirements
• Gaps between curriculum content & employer expectations
• Recognition of need for internships/co-ops
Lesson Learned

- It is a process not a project

- Better to take small, manageable steps
  - Can collect, analyze and track data
  - Small “wins” lead to “buy-in”

- Institutionalization is a continuous process
Question and Answer
# Schedule of Webinars

Please mark your calendar for the 2012 Community of Learners Webinars

- 12:00 p.m. - 1:30 p.m (Eastern)
- 11:00 a.m. – 12:30 p.m. (Central)
- 9:00 a.m. – 10:30 a.m. (Pacific)

<table>
<thead>
<tr>
<th>May 9</th>
<th>September 12</th>
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<tbody>
<tr>
<td>June 6</td>
<td>October 10</td>
</tr>
<tr>
<td>July 11</td>
<td>November 7</td>
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<tr>
<td>August 8</td>
<td>December 12</td>
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