Skills Certification System
Producing a High-Performance Manufacturing Workforce

Certification Learning Network
April 27, 2011
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 🙋.

• 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.
2011 Schedule of Webinars

Webinars will be from 12:00-1:30 p.m. Eastern Time

**May 25** **updated**

June 15

July 20

August 17

September 21

October 18

November 16
Implementation of the NAM-Endorsed Skills Certification System, Critical Components Driving Success
Critical Components Driving Success

1. Identify Regional Economic Demands (Data Validation)
2. Develop Implementation Timeline
3. Engage Industry Leaders
4. Engage Faculty
5. Audit Programs of Study
6. Map Certification to Programs (adjust as needed);
7. Develop Certification Partnerships
8. Deploy Dream It Do It (Student Recruitment)
9. Assess Faculty and Implement Professional Development
10. Develop Benchmarks
11. Driving a Policy Agenda
Next Generation Manufacturing in the Cleveland Region

The Business Case for Adopting the NAM-Endorsed Skills Certification System
Cleveland Metropolitan Statistical Area (MSA)

The Regional Economy
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
## Demand for Skilled Manufacturing 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</td>
<td>3,658</td>
<td>3,215</td>
<td>145</td>
<td>$14.27</td>
</tr>
<tr>
<td></td>
<td>and plastic</td>
<td></td>
<td></td>
<td></td>
<td></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,</td>
<td>1,724</td>
<td>1,587</td>
<td>75</td>
<td>$17.92</td>
</tr>
<tr>
<td></td>
<td>metal and plastic</td>
<td></td>
<td></td>
<td></td>
<td></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>

*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 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.
Telling the College Story

LORAIN COUNTY COMMUNITY COLLEGE
Lorain County Community College

• 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)
PARTNERSHIPS

A Critical Success Factor
LCCC 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
Focus Program Areas:

- Mechanical Design
- Quality
- Welding
- Machining
- Automation

Curriculum of all programs reviewed for alignment with industry certifications; gaps identified and filled
Alignment with Industry Requirements

Industry Certifications Offered:

• National Career Readiness Certificate (NCRC) (Reading for Information, Applied Math, Locating Information)
• Manufacturing Skills Standards Council (MSSC)
• American Welding Society (AWS)
• National Institute for Metalworking Skills (NIMS)
Student assessment: NCRC

- Offered to all first yr students in Spring, 2010 & 2011
- All students achieved at least Bronze status
- Weakest scores received in Locating Information
- Curriculum review underway to compare NCRC outcomes with selected course content
- Options being explored to improve Locating Information scores
- Piloting with Early College High School students
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
Student assessment: MSSC

- Cohort based delivery for dislocated workers
- Test content located in a number of courses
- Course review underway to match MSSC outcomes with specific courses
- Students will be referred to testing based on course completion
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

STRATEGIES

• Initial meetings convened in October, 2009 with MI leadership for initial conversations
• MAGNET focus on regional employers
• LCCC focus on college employer partners
EMPLOYER ENGAGEMENT

PARTNER: MAGNET

(Manufacturing Advocacy & Growth Network)

• Employer led organization
• Northern Ohio MEP
• Dream It! Do It! Sponsor
• LCCC President on MAGNET Board
EMPLOYER ENGAGEMENT

MAGNET

• Informational Workshop invitation sent by MAGNET Board members

• MAGNET identified partner companies needing production level workers now or near future

• Ten companies sent representatives to meeting
EMPLOYER ENGAGEMENT

LCCC

• Session one:
  o review of pathways
  o introduction of skills certification system

• Session two:
  o employer testimonials
  o review of wages in pathways
  o 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
- 66 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

### National Career Readiness Certificate
- Personal Effectiveness
- Academic Competencies
- Workplace Competencies

## Career Pathway

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

### Welding Technician
- 5 - 10 years experience
- $18.00 to $22.00 / hour

## Employer Job Title/Wage Range

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

### Welder / Fabricator
- 3 - 5 years experience
- $15.00 to $16.00 / hour

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

### Skilled Adults
- Retraining / Lay Offs
- Continuing Education Company Specific Apprenticeship

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Produced with support from Key Links
# Aligning Education, Certification and Career Pathways
For the Quality Assurance Industry at Lorain County Community College

## Education Pathway

<table>
<thead>
<tr>
<th>Masters and PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACHELOR OF SCIENCE / ENGINEERING DISCIPLINE</td>
</tr>
<tr>
<td>- University of Akron</td>
</tr>
<tr>
<td>- Cleveland State University</td>
</tr>
<tr>
<td>ASSOCIATE IN APPLIED STEM/SCIENCE</td>
</tr>
<tr>
<td>- 63 Credit Hours / Two Years Full Time</td>
</tr>
<tr>
<td>- 24 Courses</td>
</tr>
<tr>
<td>- Day / Evening Curriculum</td>
</tr>
<tr>
<td>STEM DIPLOMA PROGRAM</td>
</tr>
<tr>
<td>- 36 - 37 Credit Hours / One Year Full Time</td>
</tr>
<tr>
<td>- 14 Courses</td>
</tr>
<tr>
<td>- Day / Evening Curriculum</td>
</tr>
<tr>
<td>STEM CERTIFICATE PROGRAM</td>
</tr>
<tr>
<td>- 23 - 24 Credit Hours / One Year Part Time</td>
</tr>
<tr>
<td>- 9 Courses</td>
</tr>
<tr>
<td>- Day / Evening Curriculum</td>
</tr>
</tbody>
</table>

## Certification Pathway

<table>
<thead>
<tr>
<th>SME Engineering Technologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSSC CPT</td>
</tr>
<tr>
<td>NIMS</td>
</tr>
<tr>
<td>NCRC</td>
</tr>
<tr>
<td>MSSC Quality</td>
</tr>
<tr>
<td>NCRC</td>
</tr>
</tbody>
</table>

## Career Pathway

<table>
<thead>
<tr>
<th>Quality Technologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>$24.51 / hour (17-3020)</td>
</tr>
<tr>
<td>Quality Technician or Inspector</td>
</tr>
<tr>
<td>Quality Process Control Specialist</td>
</tr>
<tr>
<td>Reliability Lab Specialist</td>
</tr>
<tr>
<td>$22.54 / hour (17-3026)</td>
</tr>
<tr>
<td>Quality Control Inspector</td>
</tr>
<tr>
<td>$15.76 / hour (51-9061)</td>
</tr>
<tr>
<td>Quality Inspector</td>
</tr>
<tr>
<td>Process Control Technician</td>
</tr>
<tr>
<td>Quality Corrective Action Analyst</td>
</tr>
<tr>
<td>$15.84 / hour (51-4120)</td>
</tr>
</tbody>
</table>

## Employer Job Title/Wage Range

<table>
<thead>
<tr>
<th>Quality Engineer / Manager/Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 15 years experience</td>
</tr>
<tr>
<td>$24.00 to $28.00 / hour</td>
</tr>
<tr>
<td>Quality Engineer / Acid Etch Technician / CMM Lab Engr.</td>
</tr>
<tr>
<td>7 – 12 years experience</td>
</tr>
<tr>
<td>$16.00 to $20.00 / hour</td>
</tr>
<tr>
<td>Lab Tech / First Piece Quality Inspector</td>
</tr>
<tr>
<td>5 – 10 years experience</td>
</tr>
<tr>
<td>$15.80 / hour</td>
</tr>
<tr>
<td>Destructive Testing/ Teardown</td>
</tr>
<tr>
<td>0 – 5 years experience</td>
</tr>
<tr>
<td>$13.00 – $15.00 / hour</td>
</tr>
</tbody>
</table>

## National Career Readiness Certificate
Personal Effectiveness * Academic Competencies * Workplace Competencies

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

Produced with support from
# Aligning Education, Certification and Career Pathways

For the Mechanical Design at Lorain County Community College

## Education Pathway

### Masters and PhD
- **Bachelor of Science / Engineering Discipline**
  - University of Akron
  - Cleveland State University

### Associate in Applied STEM/Science
- 66-67 Credit Hours / Two Years Full Time
- 24 Courses
- Day / Evening Curriculum

### STEM Diploma Program
- 36 - 37 Credit Hours / One Year Full Time
- 14 Courses
- Day / Evening Curriculum

### STEM Certificate Program
- 17 Credit Hours / One Year Part Time
- 7 Courses
- Day / Evening Curriculum

## Certification Pathway

### SME Engineering Technologist
- MSSCPT
- NIMS
- NCRC

### Mechanical Drafter / Designer
- CAD Operator
- $21.26 / hour (17-3013)

## Career Pathway

- **Manufacturing Engineer**
- Manufacturing Technologist
- $23.14 / hour (17-3000)

- **Mechanical Drafter / Designer**
- CAD Operator
- $21.26 / hour (17-3013)

- **CAD Operator (Entry Level)**
- $19.55 / hour (17-3019)

- **CAD Operator (Entry Level)**
- $18.02 / hour (51-4010)

## National Career Readiness Certificate
- Personal Effectiveness
- Academic Competencies
- Workplace Competencies

## Employer Job Title / Wage Range

- **Tool or Process Engineer**
  - 5 – 10 years experience
  - Wage up to $26.00 / hour

- **Mechanical Designer**
  - Similar title
  - Must have Tool & Die experience

- **Designer Trainee**
  - 10 years experience
  - $17.00 / Hour

- **This position may have levels such as 1, 2, 3**
  - Must have design experience
  - $14.00 – $16.00 / Hour

## Key Links
- Applied STEM (High School)
  - Dual Enrollment - Career Academy - Youth Development Programs
- Out of School / Low Skill Youth / Adults
  - WIA/Career Centers – ESL/ESL - GED/ABE “Bridge” and Foundation Programs
- Skilled Adults
  - Retraining / Layoffs – Continuing Education Company Specific Apprenticeship

Produced with support from
ALIGNING EDUCATION, CERTIFICATION AND CAREER PATHWAYS
For the Machining Industry at Lorain County Community College

**EDUCATION PATHWAY**

**Masters and PhD**
- Bachelor of Science / Engineering Discipline
  - University of Akron
  - Cleveland State University

**Associate in Applied STEM/Science**
- 62 Credit Hours / Two Years Full Time
- 22 Courses
- Day / Evening Curriculum

**STEM Diploma Program**
- 39 Credit Hours / One Year Full Time
- 15 Courses
- Day / Evening Curriculum

**STEM Certificate Program**
- 19 Credit Hours / One Year Part Time
- 8 Courses
- Day / Evening Curriculum

**CERTIFICATION PATHWAY**

- SME Engineering Technologist
- NIMS
- MSSC CPT
- NCRC

**CAREER PATHWAY**

- Manufacturing Engineer
- Manufacturing Technologist
- $22.64 / hour (17-3026)
- 0 – 7 years experience
- Wage expected $30-47 K / year

- Computer-Aided Machining Designer / Programmer
- CNC Programmer
- $21.60 / hour (51-4012)
- 10 years experience
- Wage okay; varies by experience

- CNC Operator / Programmer
- $18.02 / hour (17-4010)
- 5 – 10 years experience
- $12.00 / hour more likely for this position

- CNC Operator / Programmer
- $17.74 / hour (51-4011)
- 0 – 5 years experience
- $10.00 to $15.00 / hour
- $17.74 too high of a wage

**EMPLOYER JOB TITLE / WAGE RANGE**

- Other Titles: Tool Engineer / Tool Design Engineer
- Other Titles: NONE
- Other Titles: NONE
- Other Titles: NONE

---

**National Career Readiness Certificate**
- Personal Effectiveness
- Academic Competencies
- Workplace Competencies

**Key Links**

- Applied STEM (High School)
  - Dual Enrollment - 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

Produced with support from
# Aligning Education, Certification and Career Pathways

**For the Automation (System Specialist) Industry at Lorain County Community College**

<table>
<thead>
<tr>
<th>Education Pathway</th>
<th>Certification Pathway</th>
<th>Career Pathway</th>
<th>Employer Job Title / Wage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Masters and PhD</strong></td>
<td>SME Engineering Technologist</td>
<td>Manufacturing Engineer</td>
<td>At 4 year Degree this is the same at 2 year</td>
</tr>
<tr>
<td>Bachelors of Science / Engineering Discipline</td>
<td>MSSC CPT, NCRC</td>
<td>Industrial Engineer</td>
<td>Other title: Automation Engineer</td>
</tr>
<tr>
<td>University of Akron</td>
<td></td>
<td>$22.64 / hour (17-3026)</td>
<td>10+ years of experience</td>
</tr>
<tr>
<td><strong>Associate in Applied STEM/Science</strong></td>
<td>MSSC CPT, NCRC</td>
<td>Applications Engineer</td>
<td>$18.00 to $28.00 / hour</td>
</tr>
<tr>
<td>67 Credit Hours / Two Years Full Time</td>
<td></td>
<td>Systems Design Technician</td>
<td>Other Titles: Automation Welding</td>
</tr>
<tr>
<td>22 Courses</td>
<td></td>
<td>Production Supervisor</td>
<td>Manager and Maintenance Supervisor</td>
</tr>
<tr>
<td>Day / Evening Curriculum</td>
<td></td>
<td>$19.43 / hour (49-0000)</td>
<td>10+ years experience</td>
</tr>
<tr>
<td><strong>STEM Diploma Program</strong></td>
<td></td>
<td></td>
<td>$17.00 to $22.00 / hour</td>
</tr>
<tr>
<td>Under Development</td>
<td>Repair Specialist</td>
<td>Repair Specialist</td>
<td>Other Titles: Welding Technician</td>
</tr>
<tr>
<td><strong>STEM Certificate Program</strong></td>
<td></td>
<td></td>
<td>0 – 5 years experience</td>
</tr>
<tr>
<td>Under Development</td>
<td></td>
<td></td>
<td>$10.00 to $15.00 / hr</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other Titles: Maintenance Technician</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experience: ?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wage: ?</td>
</tr>
</tbody>
</table>

- National Career Readiness Certificate
  - Personal Effectiveness
  - Academic Competencies
  - Workplace Competencies

<table>
<thead>
<tr>
<th>Key Links</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied STEM (High School)</td>
</tr>
<tr>
<td>Dual Enrollment - Career Academy – Youth Development Programs</td>
</tr>
</tbody>
</table>

Produced with support from
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
Future Economic Opportunity

Positioning the Region
STATE STRATEGIC APPROACH

• Governor’s Workforce Policy Advisory Board committed to certification program

• Chancellor & Ohio Board of Regents recognize importance of manufacturing and skills certification to state’s economy through Ohio Skills Bank projects

• Leading manufacturing employers identify need for skilled workforce
Statewide Pilot Projects

Four pilot projects:

• Employer led, USO and WIB partners
• Outcomes: NCRC; MSSC; other employer identified skill mastery
• Partnership with Board of Regents (Ohio Skills Bank), Department of Job and Family Services, and Department of Development
REPLICATION EFFORTS

• Pathways developed by LCCC shared with other institutions
• Outcomes of pilot projects disseminated for replication
• Employers validating assessments
• University System of Ohio institutions able to access training models through statewide Course & Program Sharing Network
CONTACT INFORMATION

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• **Dr. Judith Crocker**
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  http://www.magnetwork.org
Learning Network Survey
http://www.surveymonkey.com/s/HXHLVYP
2011 Schedule of Webinars

Webinars will be from 12:00-1:30 p.m. Eastern Time

May 25**updated**
July 20
September 21
November 16

June 15
August 17
October 18