Grand Rapids Community College

Course Cover Sheet

M-CAM Training Area:
☐CNC/Machining ☐Multi-Skilled/Mechatronics ☒Production Operation ☐Welding/Fabrications

Program(s): Pathways to Success in Manufacturing (CPT)

Course: Pathways to Success in Manufacturing (CPT)

Course Description: 5-week, part-time non-credit certificate course

Date Created: 2015

Faculty Developer(s)/Instructional Designers(s): Dan Keyes, Sara Yob, Steven Ray

Employer/Industry Partner: Custom Profile, Michigan Works, US District Court

College Contact: David Lovell, M-CAM Program Manager

Phone: 616-234-3168

Email: davidlovell@grcc.edu

Additional Information/Comments:

The Pathways to Success in Manufacturing (CPT) course was developed to satisfy local employer needs for production workers with more skill sets than just entry level. Employers from the M-CAM Steering Committee Discover Manufacturing communicated a need and were involved in determining course learning outcomes. The program intentionally included as many industry recognized credentials to help equip participants with the ability to overcome the criminal-background barrier.

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warrantees, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

GRCC
1914 - 2014 GREAT PAST. BRIGHT FUTURE.

Manufacturing Readiness Program Learning Outcomes Pertinent to ESL CPT

Note: Learning outcomes are integrated into active learning situations and assessed via student led demonstration of skills attainment.

Learning Outcomes:

Communication/Teamwork:

1. Identify interpersonal characteristics of a team player
2. Demonstrate the characteristics of a team player
3. Apply group dynamic principles to manufacturing situations.
4. Select appropriate communication methods
5. Interpret and clarify directions prepared by others.

Math and Measurement:

6. Apply basic math functions to solve problems.
7. Create and interpret basic graphs and charts commonly used in manufacturing.
8. Determine the role of measurement in manufacturing
9. Demonstrate the proper general measurement techniques
10. Explain calibration requirements of various measuring instruments.
11. Convert between US and metric measurement systems.

Problem Solving:

12. Explain the value of applying a problem solving system.
13. Develop a system of problem solving.

Quality Assurance:

14. Explain the effect of quality on profit.
15. Identify the effects of continuous quality improvement
16. Demonstrate the ability to apply continuous quality improvement to the manufacturing process.

Blueprint Reading:

17. Define basic blueprint terminology
18. Identify general note symbols
19. Locate notes on a print.

Workplace Skills:

20. Demonstrate consistently punctual arrival.
21. Demonstrate enthusiasm and confidence about work and learning new tasks.
22. Demonstrate appropriate dress and hygiene for successful employment
23. Demonstrate the ability to act in a polite and respectful way towards co-workers.
24. Plan and organize work.

2-2:30 PM	OSHA 30 & CPT (Steven)		Intro to Quality (Dan)	* Audit skills - Observation and Listening Exercises * Review via Jeopardy Game * Exercise: Product Process Flow plus - Product defined - form, fit & function - Defining Quality - Create Basic Process Flow - For each process step define inputs and outputs - For each input and output how measure if quality, Potential Variation & impact on quality - QMS & CI (Identification and elimination of waste tool card) - Review Quiz	5S (Sara)	Discuss, then Continue simulation to standardize procedures to maintain and control an organized workplace using visual controls.	Manufacturing Math (Steven)	
2:30-3 PM	OSHA 30 & CPT (Steven)		Intro to Quality (Dan)		5S (Sara)	Create a plan to Sustain including a process to audit Describe how 5S can help to improve workplace environmental health and safety.	Manufacturing Math (Steven)	
Week 4: 1/19-22/16								
	Tuesday 1/19	Learner Outcomes/ Content	Wednesday 1/20	Learner Outcomes/ Content	Thursday 1/21	Learner Outcomes/ Content	Friday 1/22	Learner Outcomes/ Content
7:30-8:30 AM	Clean Rooms & Medical Device Overview (Dan)	**Learner Outcomes:** * Define the terms Medical Device instrument and Industry * List and Define the 3 classifications of Medical Devices * List and give examples of differences between medical device and other types of manufacturing (e.g., auto, office furniture, etc.) and the equipment associated with these differences * Medical Device Industry: Definition, Statistics, Class of Device, W. MI companies (websites) * Manufacturing Excellence – The differences in medical device via pictures: The Big 3 (Level of particles, particulates and dual; Reduction of bioburden, Finish and clarity), Processes, Cleanrooms, Things we never would have considered (contamination control) * Review using Jeopardy game	CPT Quality - Sara	Using attrribute gages - Holes, threads - Comparator - Then self guided online Tooling U for inspections (350 or 900 modules)	Measuring & Gauging (Sara)	1. Worksheet – Read and record fractional and decimal inch ruler 2. Worksheet – Converting fraction and decimal inches to metric 3. Identify sources of error from digital caliper 4. Define bias, linearity and stability 5. Worksheet (teams) - Analyze gage repeatability and reproducibility 6. Discuss care and use of digital calipers 7. Demonstrate use of digital mic 8. Worksheet – reading the inch mic 9. Demonstrate use of height gage, radius gage, bore mic, and thread gage 10. Worksheet (teams) – complete dimensional results for test part 11. Describe function of CMM 12. Course assessment	Employability (David & John)	Employability: Effective workplace communication strategies:presentation, saying/hearing/understanding lesson. Introduce communication activities.
8:30-9:30 AM	Clean Rooms & Medical Device Overview (Dan)		CPT Quality - Sara		Measuring & Gauging (Sara)		Employability (David & John)	
9:30-10:30 AM	Clean Rooms & Medical Device Overview (Dan)		CPT Quality - Sara		Measuring & Gauging (Sara)		Practice Interviews (w/ staffing agencies?) John & David	Communication activities: Back to back partner drawing exercise. Missing information stories. Perspective lesson.
10:30-11:30 AM	CPT-Quality- Sara		Forklift Training (Steven)		Measuring & Gauging (Sara)		Practice Interviews (w/ staffing agencies?) John & David	Employability: Communication Discussion and lesson recap
11:30 AM-Noon	CPT Quality - Sara		Lunch		Lunch		Lunch	
Noon-12:30 PM	Lunch		Forklift Training (Steven)		OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)	
12:30-1:30 PM	OSHA 30 & CPT Safety (Steven)		Forklift Training (Steven)		OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)	
1:30-2 PM	OSHA 30 & CPT Safety (Steven)		Forklift Training (Steven)		OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)	
2-2:30 PM	OSHA 30 & CPT Safety (Steven)		Forklift Training (Steven)		OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)	
2:30-3 PM	OSHA 30 & CPT Safety (Steven)		Forklift Training (Steven)		OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)	
Week 5: 1/26-29/16								
	Tuesday 1/26	Learner Outcomes/ Content	Wednesday 1/27	Learner Outcomes/ Content	Thursday 1/28	Learner Outcomes/ Content	Friday 1/29	Learner Outcomes/ Content
7:30-8:30 AM	Problem Solving (Sara)	Choose Problem Statements/Case Studies. Use 8D process and compare to Corrective Action Form. Practice fishbone diagram, 5Why analysis, Is/Actual Worksheet for each teams case study. Choose criteria to pick a solution. Relate 8D to PDCA	Refresh Terminology/Quality/CPT Practice - TBD - Sara	Revisit Terminology/ In teams, use training print to answer 20 questions	Employability (David & John)	Cover Letter Lesson: Formatting, layout, and content. Present Cover Letter Worksheet. Worktime to complete resume worksheet.	Sara - Mfg Lab Visit or activity (refresh skills/teamwork, etc.)	
8:30-9:30 AM	Problem Solving (Sara)		Refresh Terminology/Quality/CPT Practice - TBD - Sara		Employability (David & John)		Sara - Mfg Lab Visit or activity (refresh skills/teamwork, etc.)	Inspection methods, High Performance Mfg Text Sec 9.1-9.3
9:30-10:30 AM	Problem Solving (Sara)		Refresh Terminology/Quality/CPT Practice - TBD - Sara		Manufacturing Math (Steven)		Sara - Mfg Lab Visit or activity (refresh skills/teamwork, etc.)	
10:30-11:30 AM	Problem Solving (Sara)		Refresh Terminology/Quality/CPT Practice - TBD - Sara	Self-directed on-line modules from Amatrol to enhance Quality content	Manufacturing Math (Steven)		Sara - Mfg Lab Visit or activity (refresh skills/teamwork, etc.)	Materials Test Lab demonstraction and practice and Injection Molding demonstrations.
11:30 AM-Noon	Lunch		Lunch		Lunch		Lunch	
Noon-12:30 PM	Employability (David & John)	Cover Letter worktime. Submit draft	OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)		Employability (David & John)	Employability: Problem solving lesson and activity.
12:30-1:30 PM	Employability (David & John)		OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)		Employability (David & John)	
1:30-2 PM	Employability (David & John)	Resume and reference page revisions. Adding skills aquired in this class to resume.	OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)		Employability (David & John)	Worktime: Finish final drafts of Resume, Cover letter, and reference page
2-2:30 PM	Lab Visit to ATC (Steven & Erica)		OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)		Employability (David & John)	
2:30-3 PM	Lab Visit to ATC (Steven & Erica)		OSHA 30 & CPT (Steven)		OSHA 30 & CPT (Steven)		Employability (David & John)	
Week 6: 2/2-5/16								
	Tuesday 2/2	Learner Outcomes/ Content	Wednesday 2/3	Learner Outcomes/ Content	Thursday 2/4	Learner Outcomes/ Content	Friday 2/5	Learner Outcomes/ Content

CPT - Pathways to Manufacturing Success
12/14/2015

Week 2: 1/5-8/16								
	Tuesday 1/5	Learner Outcomes/ Content	Wednesday 1/6	Learner Outcomes/ Content	Thursday 1/7	Learner Outcomes/ Content	Friday 1/8	Learner Outcomes/ Content
7:30-8:30 AM	First Aid/CPR (Mary McGraw)*Confirmed by El	**Learner Outcome & Content:** Emergency Response and Safety, CPR Certification	Manufacturing Math (Steven)		Site Visit - Haworth? Or lakeshore company (Erica)		Working in Teams (Sara)	Effective teams Roles/Responsibilities and Goals Stages Clear expectations
8:30-9:30 AM	First Aid/CPR (Mary McGraw)		Manufacturing Math (Steven)		Site Visit - Haworth (Erica)		Working in Teams (Sara)	Decision Making Decision making methods Source of team conflict Groupthink
9:30-10:30 AM	First Aid/CPR (Mary McGraw)		Manufacturing Math (Steven)		Site Visit - Haworth		Working in Teams (Sara)	DISC -understanding ourselves and othe
10:30-11:30 AM	First Aid/CPR (Mary McGraw)		Manufacturing Math (Steven)		Site Visit - Haworth		Working in Teams (Sara)	Meeting tools/techniques
11:30 AM-Noon	Lunch		Lunch		Lunch		Lunch	
Noon-12:30 PM	First Aid/CPR (Mary McGraw)	**Learner Outcomes & Content:** Emergency Response and Safety, CPR Certification	OSHA 30 & CPT Safety (Steven)		Employability (David & John)	Resume review and complete resume worksheet: applications of lesson regarding content. Discuss layout and appropriately listening job responsibilities and skills.	OSHA (Steven)	
12:30-1:30 PM	First Aid/CPR (Mary McGraw)		OSHA 30 & CPT Safety (Steven)		Employability (David & John)		OSHA (Steven)	
1:30-2 PM	First Aid/CPR (Mary McGraw)		OSHA 30 & CPT Safety (Steven)		Employability (David & John)		OSHA (Steven)	
2-2:30 PM	Agility & Dexterity (Dan)	**Learner Outcomes:** * Awareness that some manufacturers require dexterity/agility tests for entry level employment * List two dexterity/agility tests * Describe how the above tests are conducted and scored. **Content:** Purdue Pegboard & Roeder Manipulative Aptitude Test – Introduction, Instructions, scoring * Familiarity - YouTube, boards	Visit to CNC lab & Welding lab (Steven)		Employability (David & John)		Manufacturing Math (Steven)	
2:30-3 PM	Agility & Dexterity (Dan)		Visit to CNC lab & Welding lab (Steven)		Employability (David & John)	Resume work time in computer lab	Manufacturing Math (Steven)	
Week 3: 1/12-15/16								
	Tuesday 1/12	Learner Outcomes/ Content	Wednesday 1/13	Learner Outcomes/ Content	Thursday 1/14	Learner Outcomes/ Content	Friday 1/15	Learner Outcomes/ Content
7:30-8:30 AM	Employability (David)	Conflict resolution: Importance of, Cases and strategies, discussion and role-playing scenarios, recommendations.	Print Reading (Sara)	Why prints are important, 3 types of lines, 3rd angle print geography	CPT Quality - Dan	**Learner Outcomes:** * Best use of the book, " High-Performance Manufacturing" for MSSC Safety and Quality test prep **Content:** Vocabulary - Acronym list & glossary (w/reference to text) * Structure of Units and Chapters - Key terms, objectives, content, charts & skills, knowledge check review, test prep. Went through Chapter 1 together Students Went through Chapters 2,3,5,6 & 7 (completed as homework)	Employability (David & John)	Resume work time and first draft submission
8:30-9:30 AM	Employability (David)		Print Reading (Sara)	Draw bird house, in teams, 6 views, Review 9 more lines, section and detail views	CPT Quality - Dan		Employability (David & John)	
9:30-10:30 AM	Plant Tour w/ Manufacturing Readiness at Knape & Vogt or Custom Profile	Mfg awawareness	Print Reading (Sara)	In teams, using Bracket print, answer 20 questions, review auxiliary views	Dexterity/Agility - Dan	**Learner Outcomes:** * List two dexterity/agility tests * Describe how the above tests are conducted and scored. **Content:** Review instructions and scoring Gain Familiarity with 2 test via Practice under real conditions (competition)	Employability (David & John)	Presentation of references: importance of, listing, formatting, permission, professional vs. personal.
10:30-11:30 AM			Print Reading (Sara)	discuss title blocks, charts, one and two sided dimensions, in teams, using Support print, answer 20 questions	Dexterity/Agility - Dan		Employability (David & John)	Reference page work session. Submit draft
11:30 AM-Noon	Lunch		Lunch		Lunch		Lunch	
Noon-12:30 PM	OSHA 30 & CPT (Steven)		Intro to Quality (Dan)	**Learner Outcomes:** * Describe purpose and some elements of ISO9001 Quality Management Systems (QMS) * List specific quality measures used by manufacturers * List potential causes of variation (quality issues) for specific manufactured products * Describe relationship of QMS to continuous improvement **Content (tied to process flow in Mfg Terms & Processes and Lean/CI):** * Quality Management Systems - QMS Tool Card * ISO 9001 QMS Requirements - ISO 9001:2008 QMS Tool Card and 2015 Revisions	5S (Sara)	Describe differences in workplace appearance and functionality before and after the 5S process has been applied. Plan scope, goal, requirements logistics for use with developed assembly and scheduling area simulations.	Manufacturing Math (Steven)	
12:30-1:30 PM	OSHA 30 & CPT (Steven)		Intro to Quality (Dan)		5S (Sara)	Start simulation for sort, using developed store, red tags, and log	Manufacturing Math (Steven)	
1:30-2 PM	OSHA 30 & CPT (Steven)		Intro to Quality (Dan)		5S (Sara)	Discuss, then continue simulation to organize a workplace by applying the concepts of Set in Order, and Shine.	Manufacturing Math (Steven)	

7:30-8:30 AM	Employability (David & John)	Interview skills lesson presentation, discussion. Dress for Success. What, How, Why technique for question resposne. Discussing potential criminal histroy.	CPT Quality/Refresh - Sara	SPC Average Range Chart - calculate	Teamwork refresh/Measuring refresh & any CPT - Sara	High Perf Mfg textbook - Teams sections 6.1-6.3 - complete mini lab on pg 156 to brainstorm solutions	Employability Team	Finish printing, Interview preperation.
8:30-9:30 AM	Employability (David & John)		CPT Quality/Refresh - Sara	SPC Average Range Chart - analyze	Teamwork refresh/Measuring refresh & any CPT - Sara	High Perf Mfg textbook - Prod Components Chapter 13 , Knowledge check: matching vocabulary terms	Employer Interviews (David, John, Erica, John VE)	Employer Interviews (1/2) of student count. Organized and facilitated by job development/employability staff.
9:30-10:30 AM	Employability & Interview practice (more staffing firms?)David & John	Mock Interviews with staffing agencies or job developers. Written feedback submitted to Employability staff.	CPT Quality/Refresh - Sara	On line Tooling U modules for Q, Mfg Proc	Teamwork refresh/Measuring refresh & any CPT - Sara		Employer Interviews (David, John, Erica, John VE)	
10:30-11:30 AM	Employability & Interview practice (more staffing firms?) David & John		CPT Quality/Refresh - Sara	Online Tooling U modules for Q, Mfg Proc	Teamwork refresh/Measuring refresh & any CPT - Sara		Employer Interviews (David, John, Erica, John VE)	
11:30 AM-Noon	Lunch		Lunch		Teamwork refresh/Measuring refresh & any CPT - Sara	On-line Tooling U modules to complete designed online portions of curriculum.. (see MSSC vs Tooling U matrix)	Employer Interviews (David, John, Erica, John VE)	
Noon-12:30 PM	OSHA 30 & CPT or Manufacturing Math (Steven)		OSHA 30 & CPT or Manufacturing Math (Steven)		Lunch		**Celebration Lunch**	
12:30-1:30 PM	OSHA 30 & CPT or Manufacturing Math (Steven)		OSHA 30 & CPT or Manufacturing Math (Steven)		Employability (David & John)	Mock Interview feedback, one-on-one coaching, group interview trends and feedback discussion.	**Celebration Lunch**	
1:30-2 PM	OSHA 30 & CPT or Manufacturing Math (Steven)		OSHA 30 & CPT or Manufacturing Math (Steven)		Employability (David & John)		**Graduation (John VE to invite court groups)**	
2-2:30 PM	OSHA 30 & CPT or Manufacturing Math (Steven)		OSHA 30 & CPT or Manufacturing Math (Steven)		Any other Interview prep (Coaches & Job Developers with John VanElst)	Researching employers and employment opportunities for interviews. Prepare questions.	**Graduation**	
2:30-3 PM	OSHA 30 & CPT or Manufacturing Math (Steven)		OSHA 30 & CPT or Manufacturing Math (Steven)		Any other Interview prep (Coaches & Job Developers with John VanElst)			

HIGH-PERFORMANCE MANUFACTURING

PORTABLE PRODUCTION SKILLS

MANUFACTURING SKILL STANDARDS COUNCIL

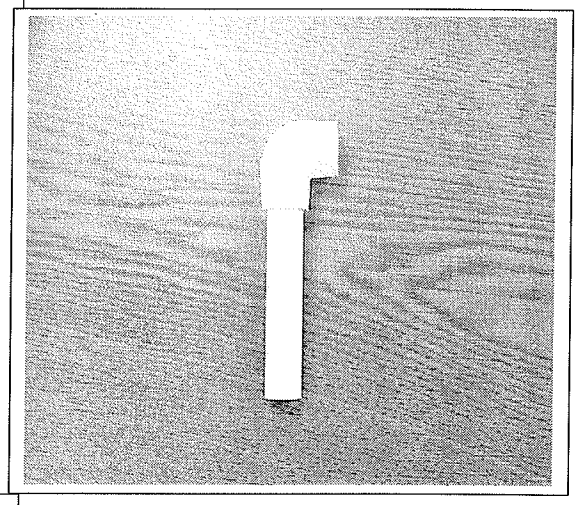
MSSC

Tools for Workforce Excellence

Mc Graw Hill Education

Standardized Work Chart

Division: Acoustic **Dept: 514,515**				**Zone: Green**	**Takt time: 20 sec**
Operation: MB2003 Assembly **station: Weld**				Prepared by: SY	**Cycle time: 3 sec**
Step #	Work Element Description	Processing time			**Work Station**
		Manual	machine	walking	
1	Get 1 elbow and 1 straight tube	`1sec			
2	Assemble parts a				
3	Group in designated lot size	1sec			
4	Repeat process				



Standardized Work Chart

5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
Total time		3 sec		

LEAN SIMULATION / FINANCIAL ANALYSIS

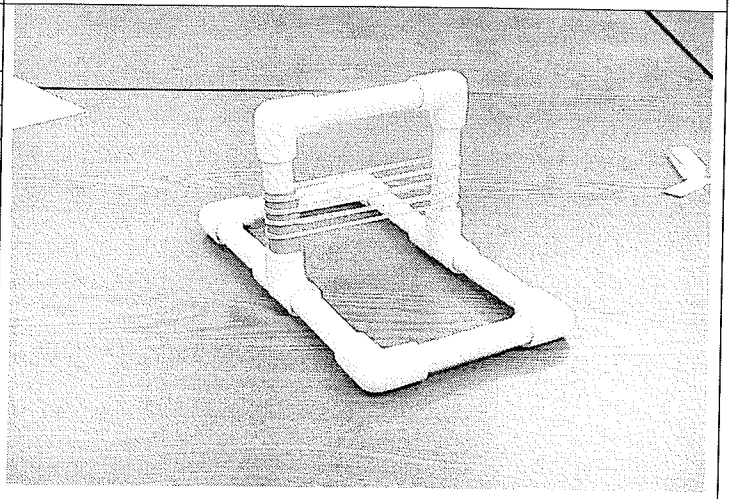
	Round 1	Round 2	Round 3
REVENUE			
# OF BANJOS SHIPPED X $200	$	$	$
COST			
MATERIAL: # OF BANJOS SHIPPED X $40	$	$	$
LABOR: # OF TEAM MEMBERS X $165	$	$	$
WORK-IN-PROCESS			
# WELDED X $5	$	$	$
# ASSYED X $35	$	$	$
# LABELED X $40	$	$	$
# STRUNG X $55	$	$	$
TOTAL W-I-P	$	$	$
SCRAP # X $40	$	$	$
OVERHEAD # OF TABLES X $150	$	$	$
TOTAL COST	$	$	$
NET PROFIT (LOSS)	$	$	$

Standardized Work Chart

Division: Acoustic	**Dept: 514,515**	**Zone: Green**	**Takt time: 20 sec**
Operation: MB2003 Assembly	**station: String**	Prepared by: SY	**Cycle time: 18 sec**

Step #	Work Element Description	Processing time		
		Manual	machine	Walking
1	Take labeled banjo body and 4 rubber bands	4 sec		
2	Install as shown	12sec		
3	Group in designated lot size	2 sec		
4	Repeat process			
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
Total time		18sec		

Work Station

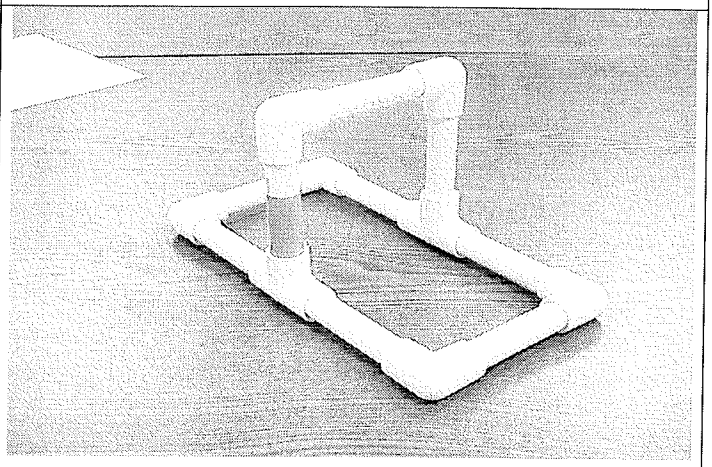


Michigan Banjo

Division: Acoustic **Dept: 514,515**	**Zone: Green**	**Takt time: 20 sec**
Operation: MB2003 Assembly **station: Label- And inspect**	Prepared by: SY	**Cycle time: 7 sec**

Step #	Work Element Description	Processing time		
		Manual	machine	walking
1	Attach label per drawing	2 sec		
2	Group in designated lot size	3 sec		
3	Repeat process	2 sec		
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
Total time		7 sec		

Work Station



Banjo body
With label

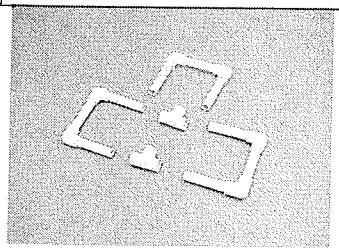
QUALITY STANDARD FOR BANJO BODY

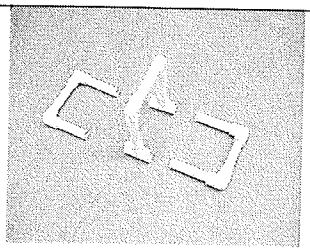
Standardized Work Chart

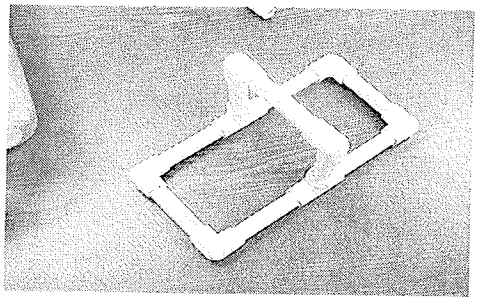
Division: Acoustic **Dept: 514,515**	**Zone: Green**	**Takt time: 20 sec**
Operation: MB2003 Assembly **station Assemble**	Prepared by: SY	**Cycle time: 16 sec**

Step #	Work Element Description	Processing time		
		Manual	machine	walking
1	Take 2 J tubes and 1 straight tube	1 sec		
2	Assemble 3 pieces into a U	2 sec		
3	Repeat 2 more times	6 sec		
4	Take 3 U's and 2 T's	4 sec		
5	Assemble as shown	2 sec		
6	Group in designated lot size	1 sec		
7	Repeat process			
8				
9				
10				
11				
12				
13				
14				
15				
Total time		16 sec		

Work Station







Banjo body

SIMULATION (MI Banjo)

- Visually see waste
- Impact of improvements on profitability

Training Solutions/GRCC
9/22/09

Simulation

- **Build Michigan Banjos**
- **Goal: make the process better by eliminating waste**
- **2 to 3 Rounds**
  - **Performance Feedback (Financial Spreadsheet)**
  - **Discussion**

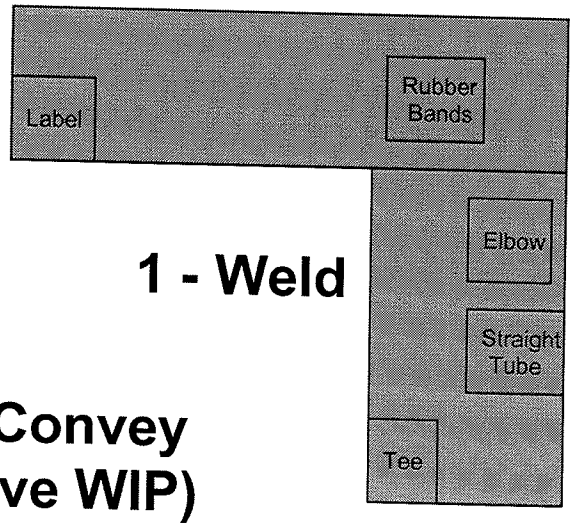
Round 1 Rules

- No talking
- Must work within your assigned space
- No modifications allowed unless instructed by facilitator
- Lot size = 5
- Number of team members = 5
- Conveyance = Push
- Quality and Work Standards = Standardized Work Chart
- Layout = Refer to next sheet

Round 1 Layout

3 – Label & Inspect

Customer



4 - String

1 - Weld

CFO

5 – Convey (move WIP)

2 - Assemble

4

Training Solutions/GRCC
9/22/09

Round 1

- **6-8 minutes**
- **Net Revenue Analysis**
- **Discussion**
  - **What went wrong?**
  - **Were we producing quality product?**
- **Replenish materials (disassemble)**

Round 2 Rules

- **Changes (1 for each team)**
- **Lot Size =**
- **Number of team members =**
- **Communication encouraged (Inspection & Feedback)**
- **Conveyance =**
- **Layout =**

Round 2

- **6-8 minutes**
- **Net Revenue Analysis**
- **Discussion**
- **Replenish materials (disassemble)**

Round 3

Your team decides how to further improve the process an attain/maintain quality.

Everything is fare game, as long as you produce to original customer requirements.

- **Customer demand is 10.**
- **Available time is 5.**

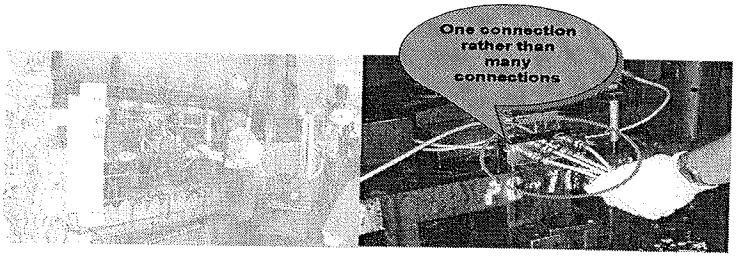
Round 3

- **5 minutes**
- **Net Revenue Analysis**
- **Discussion**
- **Disassemble**

Lean Tools

Goals: **Zero tolerance for waste**
Zero Defects

QUICK SET UP
(CHANGEOVER, SINGLE MINUTE EXCHANGE OF DIES-*SMED*)



What it is:

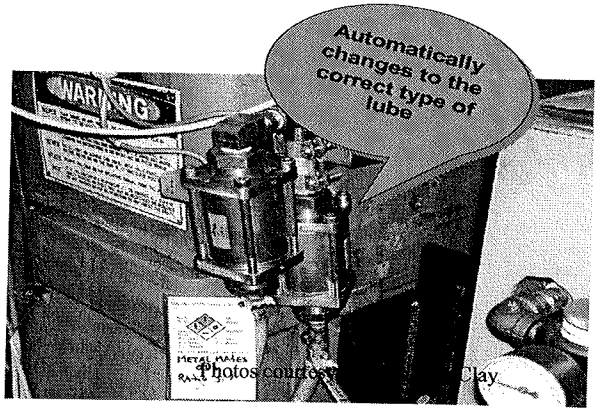
A structured process that applies to any machine that has more than one job.

It attempts to reduce the time between the "last good piece" and the "first good piece" to a minimum

Internal changeover time begins when the current processing task is finished. It ends when the next processing task produces a defect-free product.

External changeover time is the time spent by the associate carrying out the set up procedures independent of the machine, while the machine is operating

Goals:
1. To convert internal time to external time using CIA's and equipment improvements (*machines have more uptime and become more flexible)*
2. To combine, reduce or eliminate the labor required for external time *(set-up labor is reduced)*



photos courtesy of Clay

How to implement?

- Identify process with high improvement potential
- Develop standard set up process to meet established goals
- Define team and train each member in relationship to the standard process
- Implement
- Document and do follow up (show before/after improvement/measures)

Why?

- ✓ Reduces waste and shortens lead times
- ✓ Improves manufacturing capacity, flexibility, and quality

Who uses the tool?

Any employee involved in changing from one process to another

Lean Tools

ERROR PROOFING
(MISTAKE PROOFING, POKA-YOKE)

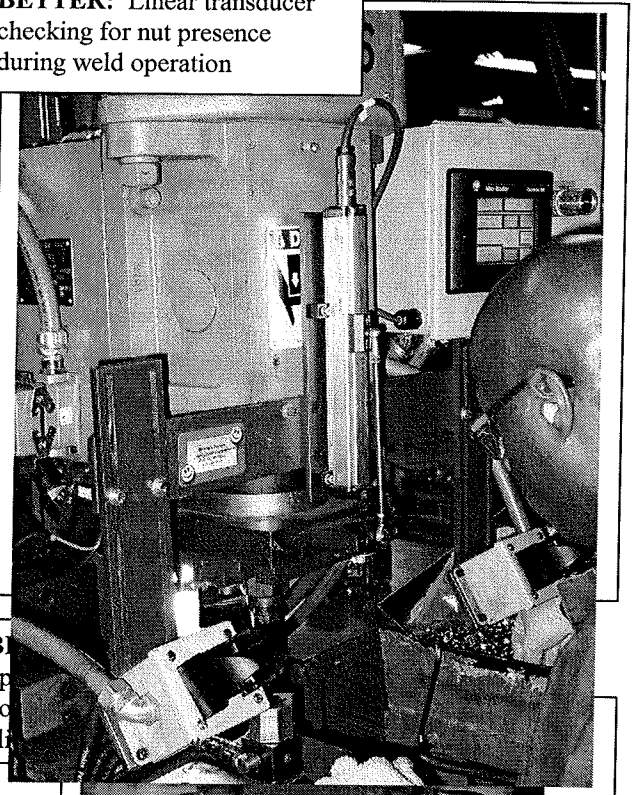
Goals: **Zero tolerance for waste**
Zero Defects

What it is:
Removal of all potential causes of error either through design, process, or mistake proofing devices. Error proofing can be applied to machines, material or people. ***Automotive customers expect error proof solutions in problem solving***

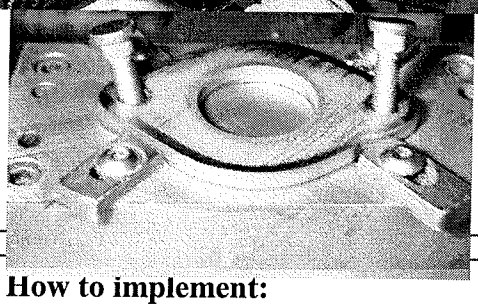
(DETECTION)
OK-error is detected at a downstream operation after it is made, but defective product does not get to the customer
GOOD-error is detected in the same place it is made

(PREVENTION)
BETTER-error is prevented in the same place it can be made
BEST-the design of the part or process does not allow errors to be made

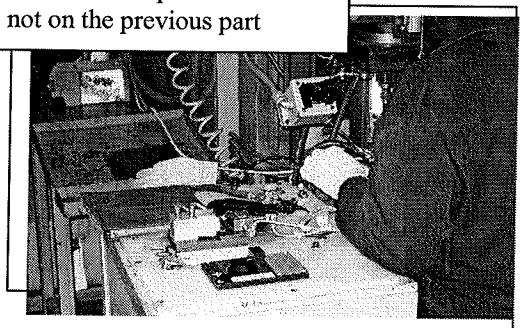
BETTER: Linear transducer checking for nut presence during weld operation



B
up
ho
ali



GOOD : Operator can not weld the next part if the nut is not on the previous part



Photos courtesy of Pridgeon and Clay

How to implement:
- ✓ Get organizational commitment for ***prevention*** rather than ***detection***
- ✓ Identify opportunity for error proofing solution
- ✓ Train as needed in technologies and methodologies
- ✓ Make fiscal decision to choose error proofing solution

Why use it?
- Mistakes caught early cost less to fix
- No scrap, no rework
- Reduces rework
- Supports APQP

Who uses the tool?
- ❑ Design Engineers
- ❑ Quality Engineers
- ❑ Process Engineers
- ❑ Production Personnel

OVERPRODUCTION

Producing More or Earlier THAN THE CUSTOMER REQUESTS

EXAMPLE:

IMPACT:

INVENTORY

MORE PRODUCT/MATERIAL IS ON HAND THAN IS NECESSARY TO MEET THE CUSTOMERS' NEEDS

EXAMPLE:

IMPACT:

MOTION

ANY EXTRA MOVEMENT OF THE OPERATOR WHILE PERFORMING THE WORK SEQUENCE

EXAMPLE:

IMPACT:

OVERPROCESSING

DOING MORE TO THE PRODUCT THAN THE CUSTOMER REQUESTED

EXAMPLE:

IMPACT:

TRANSPORTATION

MOVING THE PRODUCT MORE THAN IS NECESSARY

EXAMPLE:

IMPACT:

WAITING

ANY TIME VALUE CANNOT BE ADDED BECAUSE OF A DELAY

EXAMPLE:

IMPACT:

CORRECTION

ANYTHING THAT IS NOT 'DONE RIGHT THE FIRST TIME' (REWORK, INSPECTION, TOUCH-UP)

EXAMPLE:

IMPACT:

KNOWLEDGE

FAILURE TO CAPTURE AND USE INDIVIDUAL AND COLLECTIVE KNOWLEDGE AND EXPERIENCE OF OUR EMPLOYEES

EXAMPLE:

IMPACT:

Lean Tools

Goals: **Zero tolerance for waste**
Zero Defects

"All we are trying to do is shorten the lead time..." Taiichi Ohno

Overview of Lean Manufacturing

Toyota Production System (TPS)

- **Lean Mfg is modeled after Toyota Production System (TPS)**
- **Early 1960's, Taiichi Ohno pioneered TPS reflecting philosophies of waste elimination and time management**
- **Characterized by highly skilled "work cell" jobs and emphasis on quality and efficiency**

Three core concepts

1. **Zero Tolerance For Waste**
2. **Stabilize the production environment**
   - ? The highest quality product can only be achieved in a stable environment
   - ? Standardization, consistency and predictability and repeatability are the goals
3. **Customer "Pull" / Just-In-Time (JIT)**
   - Build only what the customer wants
   - Deliver a perfect part when it is expected

Basically....

- ? **Focus on the product and its value stream**
- ? **Assess activities as waste or adding value**
- ? **Enhance the value & eliminate the waste to optimize the process**

Lean Manufacturing Tools

- 5S
- Standardized Work
- Kanban
- Quick Changeover
- Poka yoke
- TPM
- Constraints management
- Kaizen
- Problem Solving

Two distinct manufacturing philosophies:

Mass production:	Lean manufacturing:
? Optimize process cycle time and push demand through the chain	? Produce to customer requirement and pull demand through the chain
? Maximize production lot size to increase utilization	? Constantly reduce set up time to increase utilization
? Avoid shortages by carrying inventory at all points	? Maintain minimum inventories at strategic buffer points to smooth production
? Deploy containment nets to address quality failures	? Ensure quality by increasing capability

8 areas of waste

Overproduction	Inventory
Transportation	Waiting
Motion	Over processing
Correction	Not using employee's knowledge

Lean Tools

Goals: **Zero tolerance for waste**
Zero Defects

PROBLEM SOLVING

What it is:
Using a systematic (structured) problem solving method in order to improve the process

Plan-Do-Check-Act, 8-Step, or customized, documented plans to solve problems in teams

Six Sigma (6σ) is a problem solving system that emphasizes analytical methods for decision making when solutions are not clear.

Why use it?
- ✓ It surfaces problems so they can be resolved
- ✓ Leads to a more stable production environment and higher quality product
- ✓ Allows employees to be involved in formal problem solving activities

TEAM PROBLEM SOLVING MODEL

1. Identify the problem
2. Form a team
3. List possible causes and choose a 'root' cause
4. List possible solutions and choose the' best' solution
5. Test the solution *(if it works, go on to the next step, if it does not work, return to step #4 and choose another solution. If no solution works, choose another 'root' cause and continue the process*
6. Implement the solution
7. Do follow-up to verify that the problem does not re-occur

How to implement:
1. Develop a step-by-step method of problem solving in teams
2. Train
3. Set up problem solving teams when necessary
4. Allow teams to follow the established process

Who uses the tool?
Any employee who has an idea that might improve the process within the organization

Resume Worksheet

Full Name _____

Email Address _____

Phone Number _____

Mailing Address _____

_____

Objective:

_____

_____

Work Experience (Most Recent)

Name of Company _____ City, State _____

Position _____

Start Date _____ End Date _____

Responsibilities:

- _____
- _____
- _____
- _____
- _____
- _____

Work Experience #2

Name of Company _____ City, State _____

Position _____

Start Date _____ End Date _____

Responsibilities:

- _____
- _____
- _____
- _____
- _____
- _____

Work Experience #3

Name of Company _____ City, State _____

Position _____

Start Date _____ End Date _____

The language you use in your résumé says a lot about what type of employee you are and your competency level. The following pages will help you choose words that are applicable and relevant to portray the best image of your abilities.

Key Words/Action Words

Actively
Established
Evaluate
Participated
Schedule
Coordinate
Increased
Proposed
Strategy
Created
Launched
Reduced
Support
Effect
Eliminate
Organized
Originate
Approve
Generate
Program
Solve
Control
Improve
Recommend
Supervise
Direct
Manage
Motivated
Responsibilities
Revise
Analyze
Founded
Pinpointed
Set up
Completed
Interpret
Proficient
Successfully
Demonstrate
Maintain
Revamped
Responsible
Administer
Expedite
Plan
Simplicity
Conduct
Implemented
Provide
Streamline
Develop
Lecture
Reorganized
Accelerated
Adapted
Expanded
Perform
Significantly
Conceived
Influence
Proved
Structure
Delegate
Lead
Reinforced
Teach

Self-Describing Words

Professional
Active
Diplomatic
Loyal
Respective
Analytical
Attentive
Determined
Logical
Resourceful
Ambitious
Efficient
Energetic
Independent
Reliable
Alert
Economical
Objective
Optimistic
Realistic
Aggressive
Discrete
Methodical
Sense-of-humor
Sincere
Adaptable
Disciplined
Mature
Self-reliant
Broad-minded
Enterprising
Personable
Tactful
Creative
Imaginative
Perceptive
Systematic
Constructive
Forceful
Productive
Sophisticated
Consistent
Fair
Practical
Will relocate
Conscientious
Extroverted
Positive
Will travel
Enthusiastic
Pleasant
Talented
Dependable
Trustworthy
Ethical

Keywords for Interpersonal Traits

Ability to delegate
Accurate
Assertive
Creative
Ethical
Follow up
Leadership
Oral communication
Public speaking
Self accountable
Supportive
Tenacious
Ability to implement
Adaptable
Communication skill
Customer oriented
Flexible
High energy
Multitasking
Organizational skills
Results oriented
Self management
Takes initiative
Willing to travel
Ability to plan
Aggressive
Competitive
Detail minded
Follow instructions
Industrious
Open minded
Persuasive
Risk taking
Sensitive
Team building
Ability to train
Analytical ability
Conceptual ability
Empowering others
Follow through
Innovated
Open communication
Problem solving
Safety conscious
Setting priorities
Team player

JOHN DOE

622 Godfrey SW, Grand Rapids MI |
616-234- 3168 | davidlovell@grcc.edu

SUMMARY

A driven, experienced college graduate looking for an opportunity to apply my education, experience, and creativity to improve the student experience at a secondary educational institution.

EXPERIENCE

(Dec 2014-Current) **Job Developer** |

Grand Rapids Community College | *Grand Rapids, MI*

- Assisted graduating students in finding and securing long-term, meaningfully employment.
- Networked with community employers to identify workplace needs and assist in filling those needs with qualified candidates.

(Oct 2013-Oct 2014) **Retention Specialist** |

Goodwill Industries | *Grand Rapids, MI*

- Instructed employability-skills workshops to assist participants in establishing a career.
- Developed long-lasting relationships with participants to help identify and overcome barriers to sustaining employment

EDUCATION

May, 2014 **Bachelor's Degree of Business Administration** |

Ferris State University | *Big Rapids, MI*

May, 2012 **Associate's Degree of Arts** |

Grand Rapids Community College | *Grand Rapids, MI*

Reference Worksheet:

Reference Option #1:

Name _____

Relationship _____

Phone # _____

Email _____

Permission? ☐
Yes

Reference Option #2:

Name _____

Relationship _____

Phone # _____

Email _____

Permission? ☐
Yes

Reference Option #3:

Name _____

Relationship _____

Phone # _____

Email _____

Permission? ☐
Yes

Backup Option #1: _____

Backup Option #2: _____

March 31, 20XX

Mr. John M. Smith
Senior Recruitment Consultant
Company ABC
55 ABC Avenue
City ABC, State ABC 11111

Dear Mr. Smith:

Your advertisement for a software engineer in the July issue of Magazine ABC caught my attention. I was attracted to the ad by my strong interest in software design and Database.

I have worked with a CALMA system to develop VLSI circuits and I have substantial experience designing interactive CAD software. As a result of this experience, I can make a direct and immediate contribution to your organization. I have enclosed a copy of my resume, which details my qualifications and suggests how I might be of service to your organization.

I would like to meet with you to discuss your open position for a software engineer. If you wish to arrange an interview, please contact me at the above address or by telephone at (000) 555-1234.

Thank you for your consideration.

Sincerely yours,

John Doe

JOHN SMITH

877-875-7706 | info@greatresumesfast.com

(Date)

(Company Name)
(Hiring Manager's Name)
(Address)
(City, State, Zip)

Dear (Hiring Manager's Name):

Thank you for allowing me to present myself as a candidate for the position of Mechanical Trades Instructor, a prospect about which I am very excited. Given my background, I can understand the need for an Instructor who maintains a working knowledge of the industry and can effectively transfer that knowledge to students through comprehensive instruction and hands on experience. What this means for you is that as Mechanical Trade Instructor I can bring the skill, insight, and expertise to motivate students in the classroom.

As a Mechanical Trades Instructor for the past six years I have led up to 5 classes per intake with 24 students per intake and 5 intakes a year covering topics such as Trade Calculations, Applied Physics, Hydronics Theory, Plumbing Theory and Gas Fitting Theory. My dedication to the industry partnered with my ability to mentor new instructors makes me an ideal candidate for the position.

I would welcome the opportunity to meet with you to further discuss how my strengths would fit into your institution. Thank you for your consideration. I look forward to hearing from you soon.

Sincerely,

Enclosure: Résumé

Worksheet

Your name
Your address
Your city, state, zip
Your phone number
Your email address

Today's date

Manager's name and title
Department's name
Company's name
Address
City, state, zip

Re: (Job code, if listed in an ad or job posting)

Dear (Mr. or Ms.):

Get the manager's attention

_____

_____

Rouse the manager's interest

_____

_____

Create a desire to meet you

- _____
- _____
- _____

Ask the manager to take action

_____

_____

Sincerely,

Your Signature

Pat Perfect

Employer Research Sheet

Company _____

Notes:

Interview Questions:

Company _____

Notes:

Interview Questions:

Company _____

Notes:

Interview Questions:

Company _____

Notes:

Interview Questions:

Company _____

Notes:

Interview Questions:

Company _____

Notes:

Interview Questions:

M-CAM

Subject Matter Expert (SME) Course Review Summary

College: Grand Rapids Community College

M-CAM Training Area: ☐CNC/Machining ☑Multi-Skilled/Mechatronics ■Production Operation ☐Welding/Fabrication

Degree Program **Name:** Pathways to Success in Manufacturing, Certified Production Technician (CPT)

Title of Course: Pathways to Success in Manufacturing, Certified Production Technician (CPT)

Subject Matter Expert (SME) **Reviewer Information**

Name: Jenny Redes
Title: Human Resource Manager
Phone: 616 - 389 - 1246
Email: Jredes@custom-profile.com
Organization/Affiliation: Custom Profile

Attach Resume or provide credentials (showing years of experience and work experience that is relevant to course content):

Synopsis of Findings:

Overall, I feel the program is good for candidates looking to get into manufacturing. All of the skills learned are beneficial for their roles.

Reviewers Signature J Redes Date: 3-9-17

Michigan Coalition for Advanced Manufacturing
Subject Matter Expert Course Review

1. Course Overview and Objectives	Exceptional	Satisfactory	Ineffective
The goals and purpose of the course is clearly stated.	✓		
Prerequisites and/or any required competencies are clearly stated.		✓	
Learning objectives are specific and well-defined.	✓		
Learning objectives describe outcomes that are measurable.	✓		
Outcomes align to occupational focus (industry skills and standards).	✓		
Comments or recommendations: The candidates have a basic understanding of what is needed in Mfg.			

2. Material and Resources	Exceptional	Satisfactory	Ineffective
The instructional materials contribute to the achievement of the course learning objectives.	✓		
The materials and resources meet/reflect current industry practices and standards.			
The instructional materials provide options for a variety of learning styles.			
Resources and materials are cited appropriately. If applicable, license information is provided.	✓		
Comments or recommendations:			

3. Learning Activities	Exceptional	Satisfactory	Ineffective
Provide opportunities for interaction and active learning.	✓		
Help understand fundamental concepts, and build skills useful outside of the learning object.	✓		
Activities are linked to current industry practices and standards.	✓		
Comments or recommendations:			

Michigan Coalition for Advanced Manufacturing
Subject Matter Expert Course Review

4. Assessment Tools/Criteria for Evaluation	Exceptional	Satisfactory	Ineffective
The course evaluation criteria/course grading policy is stated clearly on syllabus.		✓	
Measure stated learning objectives and link to industry standards.		✓	
Align with course activities and resources.		✓	
Include specific criteria for evaluation of student work and participation.		✓	
Comments and recommendations:			

5. Equipment/Technology	Exceptional	Satisfactory	Ineffective
Meets industry standards and needs.	✓		
Supports the course learning objectives.	✓		
Provides students with easy access to the technologies required in the course/module.	✓		
Comments and recommendations:			

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

2nd

Jenny Redes, SHRM-CP

HR Manager at Custom Profile

Junior Achievement USA • Grand Valley State University

Greater Grand Rapids, Michigan Area • 500+

Send InMail Connect

In my time working in the field of HR, I have been able to learn all different facets of the business and how my roles impact each and everything we do as a company. I value my working relationships and thrive on making ... See more

Highlights

17 Mutual Connections
You and Jenny both know Bonnie Mroczek, Amy Pierce, and 15 others

1 Mutual Group
You and Jenny are both in the Ferris State University Alumni group

Jenny's Articles & Activity

1,339 followers

+ Follow

Custom Profile is Hiring!
Jenny Redes, SHRM-CP on LinkedIn
July 12, 2016

Careers
Jenny shared

Great opportunity with a growing company! Apply today!
Jenny shared

Christa's photo
Jenny liked

See 1 more article

See all activity

Experience

Volunteer - JA Bowling for Financial Literacy Event
Junior Achievement USA
2015 – Present • 2 yrs

https://www.juniorachievement.org/web/ja-mgl/ja-bowling-for-financial-literacy

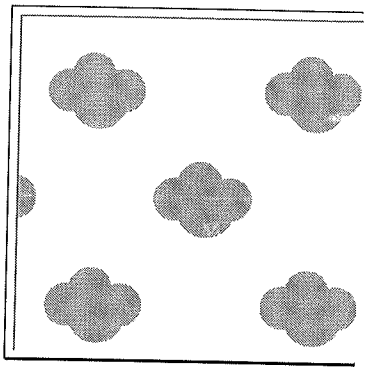
See less

HR Manager
Custom Profile
Jun 2000 – Present • 16 yrs 10 mos • Greater Grand Rapids, Michigan Area

Contact and Personal Info

Jenny's Profile, Websites, Twitter, and Bi

Show more



People Also Viewed

Christa Bird • 2nd
Chief People Officer at Custom I

Courtney Schievink • 2nd
HR Generalist at Custom Profile

Sam Nicholas • 3rd
President at Custom Profile, Inc

Rachel Leos • 3rd
Plant Manager at Custom Profil

Jim Gorant • 2nd
CFO at Custom Profile

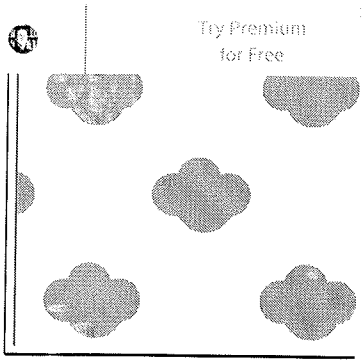
Kevin Richardson • 3rd
Plant Manager at Custom Profil

Brian Horlings • 3rd
IT/IS Manager at Custom Profile

John Boeschenstein • 3rd
Member of the Board at Childre
Assessment Center

Richard Sweers • 3rd
Strategic Buyer at Custom Profi

Karie Droge, SHRM-SCP • 2r
Director of Human Resources



Volunteer

MISHRM - Michigan Council of SHRM
2011 – Dec 2014 • 4 yrs • www.mishrm.org

See description

Volunteer

AHRM - Association of Human Resource Management
2005 – 2010 • 5 yrs • www.ahrm.net

See description

Recruiter

Grand Rapids Building Services
1999 – 2000 • 2 yrs

See description

Education

Grand Valley State University
BA, Business Management with an emphasis in HR
1995 – 1999

Volunteer Experience

Catechist
Mary Queen Of Apostles Parish
2007 • less than a year
Children

Featured Skills & Endorsements

Leadership · 80	Endorsed by **Mike Kestly**, who is highly skilled at this Endorsed by **Amy Pierce** and **1 other mutual connection**
New Hire Orientat... · 46	Endorsed by **Valorie Dewey** (mutual connection) Endorsed by **10 of Jenny's colleagues** at **Custom Profile**
Management · 45	Endorsed by **Amy Pierce** (mutual connection) Endorsed by **9 of Jenny's colleagues** at **Custom Profile**

View 36 more

Recommendations

Received (2) | Given (3)

Kris Bainbridge, PHR, SHRM-CP
HR Administrator at Davis Dental Laboratory
April 8, 2010, Kris reported directly to Jenny

Jenny and I served together on AHRM's Board of Directors, where I reported to her when she was the President. Jenny is a good leader and is willing to try new ideas.

Jenny is a great resource in the HR field. Jenny handles things

She is always willing to contribute when questions come her way.

Amy Pierce
Career Exploration Coordinator at Kent ISD
March 30, 2009, Jenny was a client of Amy's

Talk about someone who is exceptionally knowledgeable about human resources issues – Jenny is your person! Jenny stays on top of human resource and employment trends continuously. She is a wealth of information on these topics.

Jenny has helped me tremendously whenever I have had a need to seek information; she is very willing to provide recommendations of sources to speak with to achieve the knowledge I seek. Jenny has helped me become better through her willingness to share her knowledge with me.

Jenny always has a smile on her face, a great attitude and is utterly enjoyable to be around! Without hesitation, I recommend working with her in any capacity.

Accomplishments

4 **Certifications**
CPR/First Aid Instructor

See more certifications

1 **Project**
ACT's Tomorrow's Workforce Now Initiative/WorkKeys Assessments

See more

Following

Junior Achievement Alumni
411 members

Intern In Michigan - Connecting Michigan Employers to Educated Talent
1,581 members

DA Blodgett and St Johns Home
38 members

MLive Media Group
821 members

Epilepsy Foundation
4,335 followers

Continuous Improvement, Six Sigma, & Lean Group
159,180 members

See more