

Kellogg College
Course Cover Sheet



M-CAM Training Area:

CNC/Machining Multi-Skilled/Mechatronics Production Operation Welding/Fabrications

Program(s): Kellogg Advanced Manufacturing Assembly (KAMA)

Course: CSTR 124 Manufacturing Fundamentals

Course Description: Participants attending this course will learn the fundamental quality and lean manufacturing skills necessary to be successful in today's advanced manufacturing environment. During this hands-on course, participants will learn about quality and Lean principles, including the 5S system, value stream mapping, root cause analysis and apply the concepts to a production assembly simulation.

Date Created: 2014

Faculty Developer(s)/Instructional Designer(s): Applied IE, LLC

Employer/Industry Partner: Denso, TRMI, II Stanley

College Contact: Levi Good

Phone: 269-565-2828

Email: GoodL@kellogg.edu

Additional Information/Comments:

Instructional Materials:

Manufacturing blank test, answer key, final exam, student study guide

Power Points for Intro to Manufacturing, Intro to Lean, Team Building, 5S, 8D Problem Solving, Value Stream Mapping

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Battle Creek, MI
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Manufacturing Fundamentals

Course Number:	CSTR 290
Credits:	2.5
Semester:	Spring 2017
Start and End Dates:	February 14 – 24, 2017
Meeting Times/Dates:	Days and times vary
Location of Course:	Regional Manufacturing Technology Center (RMTC) 405 Hill Brady Road Battle Creek, MI 49037
Instructor:	Eric Gatmaitan
KCC Staff Email Address:	emg@appliedie.com
Instructor Phone Number:	269-252-4058
Instructor Office & Mailbox Location:	RMTC
Course Description:	Participants attending this course will learn the fundamental quality and lean manufacturing skills necessary to be successful in today's advanced manufacturing environment. During this hands-on course, participants will learn about quality and Lean principles, including the 5S system, value stream mapping, root cause analysis and apply the concepts to a production assembly simulation.
Prerequisites:	N/A
Textbook(s):	Materials provided by the instructor
Learner Supplies:	None
General Education:	N/A; this course is not a General Education course.



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Occupational Program or Accreditation Standards:

N/A

Course Competencies:

1. Lean Manufacturing: Examine the manufacturing job market, and how to better position a job candidate to successfully gain employment.
2. Team Building: Discover and experience the team building process.
3. Value Stream Mapping: Gain an overview of a lean manufacturing method for analyzing the current process and designing the ideal process.
4. 5S: Learn 5S objectives, and the focus on process waste reduction.
5. Problem Solving / Root Cause: Examine the 8D problem-solving method commonly used in the automotive manufacturing industry.
6. Production Simulation: Experience a near-realistic production environment incorporating the manufacturing fundamentals which includes lean manufacturing.

Mode of Instruction:

Students will be assigned in small groups during lectures, study groups, and hands-on workshops.



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Assignments:

Competency	Assignment	Description	Possible Points
	Pre-Assessment	Each student will be given a pre-course assessment to measure baseline knowledge in each of the competency areas	0
1-6	Study Guide	Each student will receive a study guide	
1	Participation	Students will examine Lean Manufacturing.	
1	Test	Students will take an objective test covering Lean Manufacturing.	12
2	Participation	Students will discover and experience the Team Building	
2	Test	Students will take an objective test covering Team Building	14
3	Participation	Students will learn Value Stream Mapping.	
3	Test	Students will take an objective test covering Value Stream Mapping.	9
4	Participation	Students will examine 5S.	
4	Test	Students will take an objective test covering 5S	14
5	Participation	Students will gain an overview 8D Problem Solving process commonly used in the automotive industry.	
5	Test	Students will take an objective test covering 8D Problem Solving.	13
6	Participation	Experience a near-realistic production environment incorporating the manufacturing fundamentals which includes lean manufacturing	
6	Test	Students will take an objective test covering manufacturing fundamentals	13
Total Points			75

Make-up Work, Late Assignments, and Retakes: Retests may be available and/or accommodated at the discretion of the instructor and granted on a case-by-case determination. It is the expectation that students complete and turn-in assigned work on-time and in accordance with the course syllabus and instructor guidelines. Retakes on exams, or any other related course



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assessments are not common practice, and may only be granted as the result of extreme circumstances, as determined by the instructor.

Make-ups are allowed only for students who receive prior approval to test date from the instructor.

Grade Determination:

Competency	Assignment	Points Possible	Weight
1,2,3,4,5,6	Participation	10	10%
1,2,3,4,5,6	Attendance	15	15%
1,2,3,4,5,6	Aggregate of all tests.	75	75%
	TOTAL POINTS POSSIBLE →	100	100%



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Grading Information: In this course, you will earn a pass (P) or no-pass (N) grade.

Grading Chart:

Grade	Explanation	Credit Awarded
P	Earned 70% or more of the total possible points	Yes
N	Earned less than 70% of total possible points	No

- A “P” indicates you have passed the course and academic credit is earned for the course. This is equivalent to a “C” grade or better
- To earn a “P” grade, you must earn at least 70% of the total possible points for available for the course
- An “N” indicates that you have not passed the course and no academic credit is earned
- You should be aware that an “N” grade on your academic record may jeopardize your ability to obtain federal financial aid or your ability to transfer, since many colleges and universities consider this grade a failure.

Instructor Course Policies:

- No electronic devices, food, or drinks in the manufacturing.
- Safety glasses will be supplied and must be worn during the manufacturing activity.
- Comply with instructor instructions to assure student safety and maximize the learning potential.
- Disruptive students will be ejected from the class and/or the course.



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Attendance:

1. KCC Required Statement:

Regular attendance is an essential part of the educational experience and a requirement for an adequate evaluation of each student's academic progress. Excessive absence is reported to the Academic Advising department. An Advisor will reach out to students to discuss options for success. Continued absenteeism may lead to administration action. Faculty are required to report to the Financial Aid office students who have never attended class. Federal aid may be reduced if a student does not begin attendance in all classes. This includes online courses. For more information, please visit: <http://www.kellogg.edu/wp-content/uploads/2016/08/Handbook-2016-2017.pdf>.

2. Department Specific Attendance Info:

Attendance will be taken into consideration when grades are being determined. Points are assigned for attendance in the Grade Determination chart and will count toward your final grade.

If a student has excessive absences, the instructor will notify a Career Coaches to develop an appropriate action plan to mitigate or eliminate barriers causing the excessive absences.

Drop/Add Procedures:

Drop/Add procedural information may be found at: <http://www.kellogg.edu/catalog>. The drop/add dates for every course may be found on the KCC web site at: www.kellogg.edu follow the schedule link.

Incomplete Grade and Additional Grading Policies:

For information regarding additional grading policies, please visit the KCC catalog at: <http://www.kellogg.edu/catalog>.

Disability Services:

While ensuring the academic integrity of its programs, Kellogg Community College is dedicated to providing the reasonable accommodations needed to ensure equal access to educational opportunities for individuals with verified disabilities. Disability services are provided to students who self-disclose a disability to the Support Services Department and provide appropriate documentation. Support Services may be reached at 269.965.4150 or supportservices@kellogg.edu.

Academic Integrity Policies:

Ethical conduct is the obligation of every member of the KCC community. Breaches of Academic integrity constitute serious breaches of ethical conduct. Academic integrity requires that all academic work be wholly the product of an identified individual or individuals. This policy



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demonstrates KCC's concern for academic integrity and guarantees a fair procedure for handling these concerns. Examples of unethical conduct include: cheating, fabrication, and plagiarism. For more information regarding KCC's Student Code of Conduct, please visit: <http://www.kellogg.edu/wp-content/uploads/2016/08/Handbook-2016-2017.pdf>.

Code of Conduct:

Kellogg Community College students are expected to model the skills and behaviors of working professionals. This includes exhibiting behaviors which support respect and courtesy in the class environment. For more information regarding KCC's Student Code of Conduct, please visit: <http://www.kellogg.edu/wp-content/uploads/2016/08/Handbook-2016-2017.pdf>.

Safe and Successful Campus Environment:

KCC is dedicated to providing a safe environment which is conducive to success for all students. When staff notice that a student is struggling emotionally, intellectually, or behaviorally with classroom expectations, they may notify the appropriate personnel on campus to intervene and provide assistance to that student. Academic assistance is available in The Bridge and through Academic Advising; personal counseling is also available in Support Services.

Students whose behavior suggests they are struggling may also be contacted by the KCC Director of Student Relations or by KCC Public Safety. If students have safety concerns about others' behavior in class or on campus, those students are encouraged to discuss their concerns with KCC Public Safety directly.

Academic Support Services:

Kellogg Community College is committed to your academic success. If for any reason a student is struggling with a class, speak to the Professor immediately. They are the best resource. Additional resources available include The Bridge (<http://www.kellogg.edu/services/the-bridge/>) and Support Services (<http://www.kellogg.edu/services/student-support-services/>).

Honors Contract Information:

Honors contracts are a way for students to turn any college-level KCC course into an honors course, giving them the flexibility to take ownership over learning. At the beginning of the semester, with instructor approval, a student may work with the instructor to develop a unique honors project beyond the course syllabus. Once the honors project is clearly defined and the student's project has been approved by the instructor, the student works independently on that project during the semester and may seek support from the instructor as needed; then, at the end of the semester, when the student successfully completes the honors project as outlined in the contract **and** earns at least a B+ in the course, the student will earn honors designation on their transcript. To download the honors contract and learn more about the Honors Program, please visit <http://www.kellogg.edu/academics/honors-program/>.



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Retain this Syllabus & Syllabus Disclaimer:

This syllabus is a record of learning outcomes associated with this course. Many institutions will require a copy of this syllabus to grant transfer credit. It is the student's responsibility to retain a copy for future use.

Information contained in this syllabus was, to the best knowledge of the instructor, considered correct and complete when distributed for use at the beginning of the semester. However, this syllabus should not be considered a contract between Kellogg Community College and any student, nor between the instructor and any student. The instructor reserves the right, acting within the policies and procedures of Kellogg Community College, to make changes in course content or instructional techniques without notice or obligation.

Use of Technology & Student Email Accounts:

The College has a variety of computer systems which are provided for the use of students and are to be used for education, research, academic development, and public service only. You are responsible for seeing that the computing facilities are used in an effective, efficient, ethical, and lawful manner. Computer systems, such as e-mail, are intended for college related activities only. Inappropriate messages and/or materials are not to be sent or stored. For more information, visit the KCC web page at: www.kellogg.edu.

Textbook Statement:

There are multiple choices for purchasing textbooks, including the Kellogg Community College bookstore (www.kellogg.edu - follow the on campus link to the bookstore). Please be advised that each student should fully investigate the refund policies of book retail stores, including the Kellogg Community College bookstore, PRIOR to purchasing a book for any course. When purchasing a book from the Kellogg Community College bookstore, students are encouraged not to break a textbook's binding, or open a book in shrink-wrap covering, prior to attending the first course session in order to verify that a correct book has been purchased. Students are advised to keep all receipts from book purchases.

Service Learning Option: Service learning is not an option for this course.

Subject Matter Expert (SME) Course Review Summary

College: Kellogg Community College

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

Degree Program Name: Kellogg Advanced Manufacturing Assembly (KAMA)

Title of Course: CSTR 124 Manufacturing Fundamentals

Subject Matter Expert (SME) Reviewer Information

Name: Mary Agostini, Lean Six Sigma Master Black Belt

Title: President A&W Continuous Improvement, LLC

Partner & Faculty Strategy Deployment Institute

Phone: 419-261-1490

Email: M-Agostini@hotmail.com

Organization/Affiliation: A&W Continuous Improvement, LLC

Strategy Deployment Institute

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

Synopsis of Findings:

Core competencies as listed on the course curriculum:

1. Examine the manufacturing job market, and how to better position a job candidate to successfully gain employment.
2. Discover and experience the team building process.
3. Learn 5S objectives, and the focus on process waste reduction.
4. Examine the 8D problem-solving method commonly used in the automotive manufacturing industry.
5. Gain an overview of a lean manufacturing method for analyzing the current process and designing the ideal process.
6. Experience a near-realistic production environment incorporating the manufacturing fundamentals which include lean manufacturing.

Key topics of classroom instruction:

- Quality and Lean Principles in Manufacturing
 - Pre-assessment: Determines level of competencies prior to entering the course.

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- **Introduction to manufacturing:** Provides two virtual tours of manufacturing environments, discusses the scientific method (PDCA), and details the team leader concept used in many manufacturing organizations.
 - Provides a good overview of the fundamentals of a manufacturing organization, including the role of the employer, the employee and the customer. Describes the traits of a desirable versus undesirable employee. Provides instruction on effective teamwork, effective team leadership and the PDCA scientific method. This course content provides a good basis of understanding for the participants and prepares them for the remaining course topics.
- **Introduction to Lean Manufacturing:** Provides a video of lean manufacturing and covers basic lean manufacturing topics.
 - This session provides a good introduction to lean concepts, but lacks the use of common terminology such as, batching, cross-training and 5S. Although 5S is covered in future sessions it is referred to as “workplace Organization” in this session. I suggest the instructor include or reference more commonly used terms that participants will likely encounter when they enter the workplace.
 - The 7 wastes in this session do not consistently line up with the 7 wastes as presented in the session on 5S, which could cause confusion. I suggest that the 7 waste be consistent within the two teaching sessions.
- **Helping Your Team Work:** This learning session includes a team exercise to emphasize the effectiveness of teamwork. Participants are asked to define an effective team member. Team goals and SMART goals are stressed.
 - Together, these components provide an exceptional lesson on team interaction, and the importance of teamwork in the work environment.
- **Fundamentals of 5S:** A video on the Corvette assembly plant provides a good example of real life 5S application. This session does a good job of tying in the 7 wastes of lean with 5S and visual controls. Effective examples and explanations are provided for each step in the process.
 - Very effective 5S instruction, including all of the component steps and keys to successful implementation.
- **8D Problem Solving:** This session walks students through the 8D problem solving method used in many automotive plants. It includes the use of problem solving techniques such as Fishbone diagram, Pareto chart, 5 Whys, Flowcharts, run charts, and brainstorming.
 - Provides step-by-step instruction on the effective use of 8D problem solving. Students learn to apply other techniques to identify and resolve root causes of non-conformances.
- **Value Stream Mapping:** This session covers the SIPOC high level process mapping tool, along with value analyses.
 - I would suggest including some relevant examples of value stream maps, and including the 7 wastes and how to identify them in the value stream.

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Lab Sessions:

- Lab sessions for this course utilize the assembly of model cars to simulate a manufacturing environment. The lab itself has a real-world look and feel.
- Participants play various roles in the assembly and quality fields during simulations.
- Quality data is collection and graphed, much as it would be in a real-world setting.
- Participants use data to determine problem areas and apply the lean manufacturing and quality improvement techniques they've learned in the classroom to conduct root cause analysis and develop effective solutions.
 - This course provides a practical and effective learning lab to apply the techniques and principles learned in the classroom. This reviewer is very impressed with the lab setting, and how it is being used for the course. There is evidence of quality and lean techniques being applied for learning purposes and hands-on experience.

Reviewers Signature

Mary Agostini

Date:

1/25/17

**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.	X		
Prerequisites and/or any required competencies are clearly stated.	X		
Learning objectives are specific and well-defined.	X		
Learning objectives describe outcomes that are measurable.	X		
Outcomes align to occupational focus (industry skills and standards).	X		
Comments or recommendations:			
2. Material and Resources	Exceptional	Satisfactory	Ineffective
The instructional materials contribute to the achievement of the course learning objectives.	X		
The materials and resources meet/reflect current industry practices and standards.		X	
The instructional materials provide options for a variety of learning styles.	X		
Resources and materials are cited appropriately. If applicable, license information is provided.		X	
<p>Comments or recommendations: The reviewer is unclear on the content’s citation requirements (where content was obtained versus common knowledge), however several citations were noted during the review.</p> <p>Some common industry terminology is not used in the Introduction to Lean Manufacturing session. Terms like “cross-training” and “batching, or batch production” are common in industry, but not used in the materials. I suggest that the instructor reference these more commonly used terms. There is an inconsistent use of the 7 wastes when comparing the Introduction to Lean Manufacturing session and the 5S session. I suggest that the 7 wastes be consistent in the two session to minimize confusion.</p> <p>The session on value stream mapping does not contain any examples of how VSM is used in a manufacturing environment. I would suggest including such examples and tying in the 7 wastes and how they are identified using VSM’s.</p>			
3. Learning Activities	Exceptional	Satisfactory	Ineffective
Provide opportunities for interaction and active learning.	X		

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Subject Matter Expert Course Review**

Help understand fundamental concepts, and build skills useful outside of the learning object.	X		
Activities are linked to current industry practices and standards.	X		
Comments or recommendations: The layout of this course presents classroom education with relevant examples and interesting facts pertinent to course content. Classroom session include learning activities and team events to provide interaction and experience. The lab portion provides a realistic simulated production environment where students gain hands-on experience and build skills in a team-based environment, further simulating an actual work setting.			
4. Assessment Tools/Criteria for Evaluation	Exceptional	Satisfactory	Ineffective
The course evaluation criteria/course grading policy is stated clearly on syllabus.	X		
Measure stated learning objectives and link to industry standards.	X		
Align with course activities and resources.	X		
Include specific criteria for evaluation of student work and participation.	X		
Comments and recommendations:			
5. Equipment/Technology	Exceptional	Satisfactory	Ineffective
Meets industry standards and needs.		X	
Supports the course learning objectives.	X		
Provides students with easy access to the technologies required in the course/module.	X		
Comments and recommendations: This course focuses on quality and lean production techniques in a manufacturing environment. The primary application in the learning environment is assembly. Participants who work, or will work, in other types of manufacturing environments, such as machining, fabrication, bulk production, etc. may have some difficulties translating the techniques to their particular situation.			

Michigan Coalition for Advanced Manufacturing Subject Matter Expert Course Review

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.

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MARY M AGOSTINI

EXECUTIVE MANAGEMENT

- Strategic Planning and Deployment
- Operations Assessment and Improvement
- Quality Improvement
- Safety Performance Improvement
- Product and Process Innovation

PROFESSIONAL PROFILE

Certified Lean Six Sigma Master Black Belt with over 25 years of experience in process and product innovation, process efficiency improvement, quality improvement, and training and mentoring. A proven track record in multiple industry settings, including manufacturing, health care and higher education.

CORE COMPETENCIES

- Project management
- Development of Metrics and tracking systems
- Project prioritization and assignment
- Lean Six Sigma program management
- Root cause analysis
- Solutions development
- Project benefit estimation and tracking
- Strategic alignment
- Resource management
- Change management
- Team leadership
- Analytics
- Process and product design

EXPERIENCE

PARTNER & FACULTY, STRATEGY DEPLOYMENT INSTITUTE

August, 2016 to Date

Providing training and guidance for multiple industry settings on effective strategy execution.

PRESIDENT, A&W CONTINUOUS IMPROVEMENT, LLC

June, 2013 to Date

Providing consulting services in manufacturing, healthcare, higher education and government. Implementation of process and performance improvement techniques.

DIRECTOR, PATIENT FLOW AND LOGISTICS, CATHOLIC HEALTH PARTNERS

January 2012 to September 2013

Implemented strategy execution across multiple hospitals, resulting in over \$30M increase in business performance.

LEAN SIX SIGMA MASTER BLACK BELT, MERCY HEALTH PARTNERS

March 2007 to January 2012

Implemented effective strategy deployment in the Northern Region, resulting in improved business performance, safety performance, and quality performance across the board.

LEAN SIX SIGMA MASTER BLACK BELT, JOHNS MANVILLE CORPORATION

July 1995 to March 2004

Operations consolidation resulting in \$23M return. Quality and Safety performance improvement and monitoring.

EDUCATION

UNIVERSITY OF TOELDO, 2013

BS Interdisciplinary Studies, Business Minor – graduated Magna Cum Laude

BOWLING GREEN STATE UNIVERSITY

Mechanical Engineering – 3.96 GPA

OWENS COMMUNITY COLLEGE

Statistical Engineering Technology – 3.9 GPA

COMMUNICATION

Key Note Speaker, NW Ohio Lean Consortium, 2014

Speaker, NW Ohio Lean Consortium, 2013

Speaker, VHA Lean Healthcare Conference, San Diego, 2013

LEADERSHIP

Chair of Alganssee Citizens Committee for Reformed Zoning

Chair of the Properties & Performance Committee, TAPPI

REFERENCES

SAMANTHA PLATZKE

CFO, Care Logistics

Contact information provided upon request

KIM BORDENKERCHER

CEO, Henry County Hospital

Contact information provided upon request