Grand Rapids Community College

Course Cover Sheet

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

Program(s): Welding Technology

Course: MN 231

Course Description: Welding Fabrication, Design and Testing | 4 credit, 8 contact hour course

Date Created: Previously Existed

Faculty Developer(s)/Instructional Designers(s): John Doneth

Employer/Industry Partner: American Welding Society, Lincoln Electric, Steelcase, Shape Corp, Praxair

College Contact: David Lovell

Phone: 616-234-3168

Email: davidlovell@grcc.edu

Additional Information/Comments: Aligned with AWS credential

The one-year Welding Technology Certificate Program at GRCC was adjusted through M-CAM to align with the AWS SENSE level 1 industry-recognized credential per feedback from GRCC's welding advisory committee members, who communicated that the AWS certificate was the industry standard. Employers contributing to this change were Steelcase, Shape Corp, Praxair, and others.

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MN 231 - Welding Fabrication, Design, and Testing

(4/8)

Prerequisites:

MN 136

Corequisites:

MN 230 A study of the elements of metal fabrication, the methods for destructive and nondestructive testing. The procedures for shop fabrication and field erection.

Contact Us | Site Map | Privacy Policy | Feedback | Jobs@GRCC | Dashboard
(616) 234-4722

143 Bostwick Avenue NE
Grand Rapids MI 49503-3295

MN 231 Welding Fabrication, Design, and Testing Syllabus

General Information

Instructor Name

Contact Information and Availability

Preferred method of contact:
Office Location:
Office Hours:
Phone:
E-mail:

Course Information

MN 231 Welding Fabrication, Design, and Testing
Course description: A study of the elements of metal fabrication, the methods for destructive and non-destructive testing. The procedures for shop fabrication and field erection.

1. Shop Safety
   a. Grinding Equipment
   b. Hydraulic Shears
   c. Ear and Eye Protection
   d. General Safety Rules

2. Welding Codes
   a. Writers of Codes
   b. Purpose of Codes

3. Methods of Testing Welds
   a. Destructive Testing
   b. Non-Destructive Testing

4. Blueprint and Associated Evaluations
   a. Basic Drawings
   b. Welding Symbols
   c. Weld Design
   d. Weld Cost

5. SENSE Level 1 Certification: SMAW Welding Performance Qualification Tests
   a. Flat (1G)
   b. Horizontal (2G)
   c. Vertical-Up (3G)

6. SENSE Level 1 Certification: Fabrication Projects
   a. GMAW
      i. Spray Transfer

ii.Short Circuit Transfer

b. FCAW
   i. Gas Shielded
   ii.Self Shielded

c. GTAW* *These projects are extra credit available only after the GMAW & FCAW projects are complete.*
   i. Plain Carbon Steel
   ii.Stainless Steel
   iii. Aluminum

7. SENSE Level 1 Certification: Written Tests
   a. Safety and Health of Welders
   b. Drawing and Welding Symbol Interpretation
   c. SMAW
   d. GMAW
   e. FCAW
   f. GTAW
   g. OFC/PAC
   h. Welding Inspection and Testing Principles

8. Additional Extra Credit Projects are available after all SENSE Projects are complete

Student Learning Outcomes

1. Students will demonstrate personal and equipment safety considerations that are necessary for welding and testing equipment.

2. Students will demonstrate how to apply welding codes to solve problems

3. Students will demonstrate proper techniques for destructive and non-destructive testing of weldments.

4. Students will demonstrate proper welding techniques in accordance with American Welding Society Standards.

5. Students will demonstrate design and cost analysis of weldments.

Required Materials

Text Book:
Welding Principles and Applications, Eighth Edition by Larry Jeffus.*
ISBN-10: 1-305-49469-5
**Students may use prior editions however course material may not reflect accurate references from prior editions.*

Course-Specific Requirements

This course is a lecture and lab class. Students must supply their own personal work clothes and safety equipment, such as foot wear, safety glasses. These items must be adequate for shop work. Students not dressed for work will not be allowed to work in the welding lab.

1. A student must sign in on the daily class sign-in sheet to receive credit for attendance.
2. Students must supply their own personal work clothes and safety equipment, such as: safety glasses, proper footwear, and work clothing. These items must be adequate for shop work. Tennis shoes are not recommended in the shop.
3. Students who are not dressed for work will not be allowed to work due to unsafe dress and will be considered absent and not given credit for attendance that session.
4. Any student who cheats on written work or welding projects will be removed from the class and receive an "E" grade.
5. The students will need to supply the following: textbook, writing utensil, and paper to take notes.
6. Students are responsible for all notes and handouts. Notes and handouts may be covered on the written test. Blackboard will be used when applicable.
7. Students will be assigned work stations (booths), and will be expected to keep it clean. Booths left dirty will affect your attendance grade.

Section Policies

Attendance Policy

There is not extra time available to make up laboratory projects. Students must be here each week to ensure successful completion. Students missing more than two classes will lose points for their attendance and students missing three or more classes may receive a failing grade. Written tests shall be taken early if the student has an anticipated absence on a scheduled test date.

Grading Procedure

Laboratory assignments count for 50% of the student's grade.
Attendance is 10% of the student's grade.
Tests are 40% of the student's grade.

Grading Policy

A 100-95	B 86-84	C 75-72	D 65-62
A- 94-90	B- 83-80	C- 71-69	D- 61-59
B+ 89-87	C+ 79-76	D+ 68-66	E 58

Late Assignment Policy

Late assignments will be marked down ten percent per week. Tests taken late without prior approval are subject to points being deducted.

College Policies

GRCC Email and Course Communications

Students are responsible for all communications sent via Blackboard and to their GRCC email account. GRCC student email can be accessed through Student Email (http://email.grcc.edu) and Blackboard at Blackboard (http://bb.grcc.edu).

Disability Support Services

Students with disabilities who wish to request accommodations must be registered with the Disability Support Services Office (DSS) in Room 368 of the Student Center. You may contact DSS at (616) 234-

4140 for more information. Once you are registered with the DSS Office, you will receive an *Accommodations Agreement* to present to me to verify your registration. Please see me as soon as possible so we may have a private conversation to discuss accommodations.

Student Code of Conduct

All GRCC students are held accountable to the Student Code of Conduct, which outlines expectations pertaining to academic honesty (including cheating and plagiarism), classroom conduct, and general conduct. The Code can be found in full at Student Code of Conduct.

Any student who is found cheating on any written work or welding project will be removed from the class and receive a failing grade.

Title IX Reporting Policy

If you or another student are the victim of any form of sexual misconduct (including dating/domestic violence, stalking, sexual harassment), or any form of gender discrimination, GRCC can assist you. You can report a violation of our sexual misconduct policy directly to our Title IX Coordinator at (616) 234-3169. You may also report the issue to a faculty member, who is required to notify the Coordinator, or you may make an appointment to speak confidentially to our Counseling and Career Center by calling (616) 234-3900.

GRCC is Tobacco Free

We are a tobacco free campus. For complete details on this GRCC policy or for resources about quitting go to: www.grcc.edu/beingtobaccofree

Cell Phones and other devices in the classroom

Use of telephones, pagers, players or other electronic devices *that disrupt* the learning process or teaching environment and safety of the class is prohibited in the classroom and lab.

Changes to the Syllabus

The instructor reserves the right to change the contents of this syllabus due to unforeseen circumstances. Students will be given notice of relevant changes in class, through a Blackboard Announcement, or through GRCC e-mail.

MN 231 Weldign Fabrication, Design and Testing Winter 2017

AWS SENSE Test Date*	Topic	Reading Assignment 7th Edition	8th Edition
1/19/2017	Safety	2	2
2/2/2017	Drawing & Welding Symbol Interpretation	19, 20	21, 22
2/16/2017	SMAW	3, 4, 27	3, 4, 6, 28
3/2/2017	FCAW	12, 13	12, 13, 15
3/16/2017	GMAW	10, 11	10, 11
4/6/2017	GTAW	15, 16	16, 17, 19
4/20/2017	OFC & PAC	7, 8	7, 8
4/25/2017	Welding Inspection & Testing Priciples	20, 22, 23	22, 24, 25

* Instructor reserves the right to change test dates
Textbook: Welding Principles and Applications by Larry Jeffus
Revision 1/4/17

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: Welding Technology

Title of Course: MN 231 - Welding Fabrication, Design and Testing

Subject Matter Expert (SME) Reviewer Information

Name: Jonathan Althausen

Title: Technical Representative

Phone: 724-705-3613

Email: jalthausen@lincolnelectric.com

Organization/Affiliation: Lincoln Electric

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

Synopsis of Findings:

Great syllabus, everything is very clearly defined.

Reviewers Signature _____ Date: 2/3/17

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: Great Syllabus			

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		
Comments or recommendations:			

3. Learning Activities	Exceptional	Satisfactory	Ineffective
Provide opportunities for interaction and active learning.	X		
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:			

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.	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: I agree with the program aligning with AWS SENSE.			

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Jonathan M. Althausen

OBJECTIVE

To obtain an opportunity in Sales Engineering that utilizes a determined individual with strong interpersonal and problem solving skills

EDUCATION

Grove City College — Grove City, PA — 2007-2011

B.S. Electrical Engineering

- 4 year ABET Accredited Electrical Engineering School
- QPA- 3.4/4.0 Major GPA 3.4/4.0 ~ *Cum Laude, Honors*
- Dean's List: Fall: 2009, 2010 Spring: 2008, 2009, 2010, 2011

WORK EXPERIENCE

The Lincoln Electric Company — Cleveland, OH — June 2011 - Present

Technical Sales Representative

- Graduated first place of technical sales training program with the Lincoln Electric Company
  - Competed against other engineers in a rigorous eight month program
  - Evaluation based on written exams, welding skills, presentations, leadership, and teamwork
- Given responsibility to handle a $6 million dollar sales territory based out of the Pittsburgh District Office
- Given responsibility to handle a $10 million dollar sales territory based out of the Grand Rapids Office
- Interacted with large end users such as Caterpillar, General Electric, and SMS Millcraft
- Gained technical expertise on product line and industry to educate and support distributor salesmen
- Provided lectures on advanced welding technology to vocational high schools and community colleges
- Facilitated cost savings and productivity increases for customers using innovative methods and technology
- Managed and completed sales of large capital equipment up to $230,000
- Provided cost saving reductions for end users totaling $720,000

INTERNSHIPS

Bechtel Plant Machinery Inc. — Monroeville, PA — May 2010 - August 2010

Electrical Engineering Intern

- Reviewed fuse evaluations to ensure the proper fuse was installed in rod position indication equipment.
- Analyzed fuse data sheets and utilized circuit analysis to aid in the selection process.
- Composed a failure analysis of power conversion equipment. Trended data using Excel spreadsheets.
- Helped create a template for a failure database and populated the database with failed components.
- Wrote an article for the company newsletter, a newsletter that is distributed to over 800 employees.

LEADERSHIP

Skills USA — Michigan State Chair — October 2013 - Present

- Oversee the state of Michigan welding competition for high school students
- 80 student compete for a chance to represent the state of Michigan at the national competition
- Oversee 25 volunteers, manage non-profit budget and projects

American Welding Society-West Michigan — Board Member — November 2013 - Present

- Coordinated and facilitated technical meeting gathers
- Drive the future and goals for the organization
- Volunteer and aid in non-profit fundraisers for scholarships

TECHNICAL SKILLS

Languages: C++, Matlab, Assembly

Software: Microsoft Office, SAP, CRM, Visual Studio, PSPICE, Mathematica

Welding: Gas Metal Arc, Shielded Metal Arc, Gas Tungsten Arc, Submerged Arc, Flux Cored Arc, and Robotic