

**Course Assessment Report
Washtenaw Community College**

Discipline	Course Number	Title
Welding and Fabrication	210	WAF 210 04/07/2023- Welding Metallurgy
College	Division	Department
Advanced Technologies and Public Service Careers	Advanced Technologies and Public Service Careers	Welding and Fabrication
Faculty Preparer		Ashley Jones
Date of Last Filed Assessment Report		

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

Yes

Fall 2016

2. Briefly describe the results of previous assessment report(s).

Students met the standards of success in two outcomes related to macro and micro sample prep and evaluation and identifying repair techniques.

Students did not meet the standards of success in two outcomes related to identifying different grain structures and properties and identifying different phase diagrams.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

The action plan included the following: Would like to create more assignments, labs, and lectures to explain the theories and techniques of identifying different grain structures (outcome #2) and identifying different phase diagrams (outcome #4). This assessment has shown that students struggle in those two areas the most. Hopefully, increased lectures, labs, and take-home assignments will increase the students' learning in these areas.

II. Assessment Results per Student Learning Outcome

Outcome 1: Differentiate grain structures and properties of ferrous and nonferrous metals before and after heat treatment.

- Assessment Plan
 - Assessment Tool: Written exam
 - Assessment Date: Fall 2019
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Answer key
 - Standard of success to be used for this assessment: 80% of students will score 80% or higher.
 - Who will score and analyze the data: Departmental faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
18	17

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students in both sections completed the assessment tool, with the exception of one student. They stopped coming to class halfway through the semester and did not complete the assessment tools.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Both sections used for assessing this course meet face-to-face (F2F).

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

We used three quizzes that discussed the heat treatment process of ferrous and non-ferrous materials. We have a total of 58 questions used for assessment.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Reviewing data from all three quizzes, 82% of all students (14/17) scored higher than 80%. We also noted that 92% of quizzes assessed received an 80% or higher. One student was found to have not taken two of the quizzes (43 questions) but did take the other quiz.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

An area of strength for the students is that the destructive testing labs tend to be fun, hands-on, and interesting. The students seem to enjoy experimenting and the investigation process. This results in high student participation.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Plans for improvement include updating current quiz questions to better match current industry standards and practices, as well as refining the instructions for the lab. We also plan to change the results report from a pass/fail assignment to having a more nuanced scoring rubric to better capture areas where students need more instruction.

Outcome 2: Identify different phase diagrams when working with ferrous and non-ferrous materials.

- Assessment Plan
 - Assessment Tool: Written exam
 - Assessment Date: Fall 2019
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Answer key
 - Standard of success to be used for this assessment: 80% of students will score an average of 80% or higher.
 - Who will score and analyze the data: Departmental faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
18	17

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students in both sections completed the assessment tool, with the exception of one student. They stopped coming to class halfway through the semester and did not complete the assessment tools.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Both sections used for assessing this course meet F2F.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

We use two quizzes that discuss phase diagram interpretation. We have a total of 38 questions used for assessment (These were not the same questions used for outcome number 1).

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
 Reviewing all 38 questions 94% of all students (16/17) scored 80% or higher. We also noted that 91% of the quizzes had scores higher than the 80%. One student was found to have not taken the quizzes.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

It was clear that students had a high level of understanding of phase diagrams based on the quiz scores. We were able to increase student scores by incorporating a 47-question exercise related to the heat treatment process and phase diagrams. Specific topics include Iron Carbon Diagram interpretation, crystal structure, and the effects of heat treatment on microstructures.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Plans for improvement include utilizing a wider variety of phase diagrams in class discussions so students become more familiar with unary, binary, and ternary phase diagrams.

Outcome 3: Use different types of testing equipment to identify metals as ferrous or non-ferrous and their physical properties.

- Assessment Plan
 - Assessment Tool: Lab Activity
 - Assessment Date: Fall 2019
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Departmentally-developed rubric
 - Standard of success to be used for this assessment: 80% of students will score 80% or higher.
 - Who will score and analyze the data: Departmental Faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
18	18

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students in both sections completed the assessment tool.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Both sections used for assessing this course meet F2F.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Identifying ferrous and non-ferrous materials is a very basic, low level skill, and thus is considered to be general knowledge in industry. We plan on removing this outcome as we do not have a defined tool to assess student success of this skill.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No

This outcome will be removed from the master syllabus moving forward.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

It could be assumed that students are successful in being able to identify differences between ferrous and non-ferrous materials (without specific assessment of this skill) due to their success in lab activities, class discussions, and quizzes that cover deeper/more nuanced attributes of both ferrous and non-ferrous materials.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

This outcome will be removed from the master syllabus moving forward.

Outcome 4: Apply and describe the effects of heat treatments and hardening processes for ferrous and non-ferrous metals.

- Assessment Plan
 - Assessment Tool: Written exam
 - Assessment Date: Fall 2019

- Course section(s)/other population: All
- Number students to be assessed: All
- How the assessment will be scored: Answer key
- Standard of success to be used for this assessment: 80% of the class will score a minimum of 80%.
- Who will score and analyze the data: Departmental faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
18	17

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students in both sections completed the assessment tool, with the exception of one student. They stopped coming to class halfway through the semester and did not complete the assessment tools.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Both sections used for assessing this course meet F2F.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

This outcome is nearly identical to outcome number one. Due to those similarities, we used the same assessment tools as we did in outcome number one; three quizzes that discuss the heat treatment process of ferrous and non-ferrous materials. We have a total of 58 questions used for assessment.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: <u>Yes</u>
Reviewing data from all 3 quizzes, 82% of all students (14/17) scored higher than 80%. We also noted that 92% of quizzes assessed received an 80% or higher. One student was found to have not taken two of the quizzes (43 questions) but did take the other quiz. Again, these results reflect the same results as outcome number one due to the similarities.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The area of strength for the students in this assessment is that we have a high percentage of participation in Charpy V Notch lab exercise. Due to high student participation, the students had a high level of understanding of the heat treatment process.
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8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Because this outcome so closely reflects outcome number one, we plan to remove this outcome from the master syllabus and add an outcome related to identifying mechanical properties of materials.
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Outcome 5: Perform destructive and non-destructive testing on ferrous and non-ferrous metals.

- Assessment Plan
 - Assessment Tool: Lab activity
 - Assessment Date: Fall 2019
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Checklist with rubric
 - Standard of success to be used for this assessment: 80% of students will score a minimum of 80%.
 - Who will score and analyze the data: Departmental faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
18	17

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students in both sections completed the assessment tool, with the exception of one student. They stopped coming to class halfway through the semester and did not complete the assessment tools.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Both sections used for assessing this course meet F2F.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Students are required to complete two lab assignments where they perform Tensile Pull testing and Charpy V Notch testing (both destructive testing methods). This is conducted as an experiment and thus the students' test results are not graded, rather the results reports are completed and scored as a pass/fail. The Tensile Pull results report has 45 questions and Charpy V Notch results report has 12. Each student is required to complete a results report and verbally describe the outcome of their experiments in class. We use this as a topic for class discussion (what happened, why did it happen, the variables that created variances in results, did the results match expectations, etc).

The lack of rubrics for this outcome is what necessitated the pass/fail grading, and prevented me from gathering solid data on this outcome. I have corrected this, and added rubrics for all labs in this course. With this correction, I will be able to provide student-by-student data in future assessment reports.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No
Reviewing all 17 results reports, 100% of all students completed the reports. All 17 students completed the required exercises and received a score of 100% on the destructive testing assignments. We do not currently perform nondestructive

testing methods in this class because it is a program redundancy. All students who complete a certificate, an advanced certificate, or an associate degree in welding are required to take the Welding and Fabrication (WAF) 140 class. In the WAF 140 class students are required to perform numerous nondestructive testing methods. We review these testing methods in WAF 210 but do not have labs associated with them.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

An area of strength for the students is that the destructive testing labs tend to be fun, hands-on, and interesting. The students seem to enjoy experimenting and the investigation process. This results in high student participation.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Plans for improvement include updating the current lab instructions to better help students understand how to complete the results reports. We also plan to change the results report from a pass/fail assignment to having a more nuanced grading rubric to better capture areas where students need more instruction. As we do not currently perform nondestructive testing methods in this class because it is a program redundancy, we plan to remove the nondestructive portion of this outcome from the master syllabus moving forward.

Outcome 1: Differentiate grain structures and properties of ferrous and nonferrous metals before and after heat treatment.

- Assessment Plan
 - Assessment Tool: Laboratory exercise and report
 - Assessment Date: Fall 2019
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Departmentally-developed rubric
 - Standard of success to be used for this assessment: 80% of students will score 80% or higher.
 - Who will score and analyze the data: Departmental faculty
1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
18	17

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students in both sections completed the assessment tool, with the exception of one student. They stopped coming to class half way through the semester and did not complete the assessment tools.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Both sections used for assessing this course meet F2F

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Students are required to complete a lab assignment where they perform Charpy V Notch testing. This is conducted as an experiment and thus the students' test results are not graded, rather the results reports are completed and scored as a pass/fail. The Charpy V Notch results report has 12 questions. Each student is required to complete a results report and verbally describe the outcome of their experiments in class. We use this as a topic for class discussion (what happened, why did it happen, the variables that created variances in results, did the results match expectations, etc.)

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
 100% of students were able to complete the results reports for the testing and participated in the class discussion. All 17 students completed the required exercise and received 100% on the assignment.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

An area of strength for the students is that the destructive testing labs tend to be fun, hands-on, and interesting. The students seem to enjoy experimenting and the investigation process. This results in high student participation.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Plans for improvement include updating current quiz questions to better match current industry standards and practices, as well as refining the instructions for the lab. We also plan to change the results report from a pass/fail assignment to having a more nuanced scoring rubric to better capture areas where students need more instruction.

Outcome 4: Apply and describe the effects of heat treatments and hardening processes for ferrous and non-ferrous metals.

- Assessment Plan
 - Assessment Tool: Lab Activity
 - Assessment Date: Fall 2019
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Departmentally-developed rubric
 - Standard of success to be used for this assessment: 80% of students will score a minimum of 80%.
 - Who will score and analyze the data: Departmental faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
	17

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students in both sections completed the assessment tool, with the exception of one student. They stopped coming to class halfway through the semester and did not complete the assessment tools.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Both sections used for assessing this course meet F2F.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Again, this outcome is nearly identical to outcome number one. Due to those similarities, we used the same lab assignment assessment tool as we did in outcome number one; the Charpy V Notch test laboratory exercise and report. Students are required to complete a lab assignment where they perform Charpy V Notch testing. This is conducted as an experiment and thus the students' test results are not graded, rather the results reports are completed and scored as a pass/fail. The Charpy V Notch results report has 12 questions. Each student is required to complete a results report and verbally describe the outcome of their experiments in class. We use this as a topic for class discussion (what happened, why did it happen, the variables that created variances in results, did the results match expectations, etc.)

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

100% of students were able to complete the results reports for the testing and participated in the class discussion. All 17 students completed the required exercise and received 100% on the assignment.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The area of strength for the students in this assessment is that we have a high percentage of participation in Charpy V Notch lab exercise. Due to high student participation, the students had a high level of understanding of the heat treatment process.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Because this outcome so closely reflects outcome number one, we plan to remove this outcome from the master syllabus and add an outcome related to identifying mechanical properties of materials.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

Based on the tools used to track student understanding of these concepts outlined in outcomes number 2 and number 4, 100% of students assessed met the standards of success for those outcomes.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

All students that were assessed met the standards of success; however, I do not believe the current way of evaluating student success in the lab assignments is nuanced enough with just a pass/fail option. I believe creating a more detailed grading rubric might uncover some areas that have room for improvement and isn't captured by the pass/fail grades.

Outcome number one is nearly identical to outcome number four in practice.

I am surprised that there isn't an outcome specifically mentioning mechanical properties of metals, as these are the main properties studied when performing welding and metallurgical evaluations.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

The information noted in section III.2 of this report, as well as the action plan, was shared upon completion of my draft of this document on 06/09/2023 via email to all full-time departmental faculty. We had two weeks of open discussion on the topic. After that time, everyone agreed on the proposed changes and action plan.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Outcome Language	<p>We propose the following changings to the current outcomes:</p> <ol style="list-style-type: none"> 1. Differentiate between the various properties of ferrous and nonferrous metals before and after heat treatment and hardening processes. 2. Describe and apply phase diagrams when working with ferrous and nonferrous metals. 3. Perform destructive testing on various metals to identify their mechanical properties. 4. Describe and apply proper material identification, weld process selection, and filler metal selection for welding of ferrous and 	<p>We believe the new wording/new objectives better represent the expectations of industry and transfer schools. Here are our specific reasons for each update:</p> <ol style="list-style-type: none"> 1. Current outcomes #1 and #4 address the same concepts. Combining the two outcomes helps eliminate confusion and redundancy. 2. Changing the wording from "Identify different phase diagrams" to "Describe and apply phase diagrams" in outcome #2 better articulates the expectations of the stated outcome. 3. Current outcome #3 refers to using destructive and non-destructive testing methods. We created a class (WAF 140, Testing and Inspection) within our degree path that covers non-destructive 	2023

	non-ferrous metals.	testing extensively. Due to this redundancy, we would like to remove the non-destructive requirement for the class. We would also like to change the phrasing "identify metals as ferrous or non-ferrous and their physical properties." to read "Perform destructive testing on various metals to identify their mechanical properties." How a material performs under various types of stresses are described as mechanical properties. This is one of the most important attributes of a metal. Industry and transfer schools expect our graduates to understand the mechanical properties of metals. There should be an outcome specifically addressing this. This new wording would reflect the combining/refining	
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		<p>of current outcomes #3 and #5.</p> <p>4. Due to the current outcome #4 being nearly identical to outcome #1, we propose eliminating the current outcome #4. We would like to replace it with an outcome related to weld repair and filler material selection. To be considered a competent welder fabricator, one needs to be able to trouble shoot and repair unknown components. Our graduates would greatly benefit from understanding the consequences of improper filler metal, weld process selection, and/or material identification.</p>	
Other: Rubrics, outcome 5	Rubrics have been updated for outcome 5.	I have added rubrics to all labs for this course, so I will be able to provide better student-by-student data in future assessment reports for outcome 5.	2023

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

[WAF 210 Assessment Data](#)

Faculty/Preparer: Ashley Jones **Date:** 07/12/2023
Department Chair: Glenn Kay II **Date:** 08/14/2023
Dean: Jimmie Baber **Date:** 08/21/2023
Assessment Committee Chair: Jessica Hale **Date:** 06/09/2024

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Welding and Fabrication	210	WAF 210 01/05/2016- Welding Metallurgy
Division	Department	Faculty Preparer
Advanced Technologies and Public Service Careers	Welding and Fabrication	Amanda Scheffler
Date of Last Filed Assessment Report		

I. Assessment Results per Student Learning Outcome

Outcome 1: Prepare samples for macro and micro inspection and identify crystal structures and properties of ferrous and nonferrous metals.

- Assessment Plan
 - Assessment Tool: laboratory exercise
 - Assessment Date: Winter 2017
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Departmentally-developed rubric
 - Standard of success to be used for this assessment: 70% of students will score 70% or higher.
 - Who will score and analyze the data: Departmental faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
9	8

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Not all enrolled students were assessed because some students dropped or withdrew from the course.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students in a single section were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outlined laboratory work sheet. Reviewed by instructor and presented to the class.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

The results are based on student attendance and completion - if the student attended class, completed the lab sheet and presented his/her results to the class.

The standard of success was met because 70% of the students achieved 70% or greater on this laboratory assignment.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The area of strength for the students in this assessment would be that it's a hands-on activity that is shared among the class.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Instead of having this assessment scored on attendance, I would like to adapt my lab sheet to be scored also for understanding of the material.

Outcome 2: Identify different grain structures and properties of ferrous and nonferrous metals before and after heat treatment.

- Assessment Plan

- Assessment Tool: Quiz
- Assessment Date: Winter 2017
- Course section(s)/other population: All
- Number students to be assessed: All
- How the assessment will be scored: Answer key
- Standard of success to be used for this assessment: 70% of students will score 70% or higher.
- Who will score and analyze the data: Departmental faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
9	8

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Not all enrolled students were assessed because some students dropped or withdrew from the course.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students in a single section were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Blackboard quiz was administered. It was a multiple choice quiz that has an answer key.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this

learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: <u>No</u>
Through calculation of the quiz used for this assessment, there were 62% of the students who scored 70% or higher. 5 of the 8 students assessed scored 70% or higher. This did not meet the standard of success because 70% of the students had to score 70% or higher.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The area of strength for this outcome is in the physical hands-on lab, where the students are engaged using the equipment necessary like the etchants and microscope to physically see the results of their welds and the grain structure.
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8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Plans for improvement include providing more visual aids of the grain structures that are the outcome of different techniques and materials, during the lecture and lab.
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Outcome 2: Identify different grain structures and properties of ferrous and nonferrous metals before and after heat treatment.

- Assessment Plan
 - Assessment Tool: Laboratory exercise and report
 - Assessment Date: Winter 2017
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Departmentally-developed rubric
 - Standard of success to be used for this assessment: 70% of students will score 70% or higher.
 - Who will score and analyze the data: Departmental faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
9	8

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Not all enrolled students were assessed because some students dropped or withdrew from the course.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students in a single section were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outlined laboratory work sheet. Reviewed by instructor. The laboratory worksheet was completed by the student and results for each student were presented to the class by the student.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
The standard of success was met for this outcome because 70% of the students completed the laboratory activity scoring 70% or greater.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The area of strength for this outcome is in the physical hands-on lab, where the students are engaged using the equipment necessary like the etchants and microscope to physically see the results of their welds and the grain structure.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Plans for improvement include providing more visual aids of the grain structures that are the outcome of different techniques and materials, during the lecture and lab.

Outcome 3: Identify repair techniques for various metals to coincide with the American Welding Society codes and specifications.

- Assessment Plan
 - Assessment Tool: Final exam
 - Assessment Date: Winter 2017
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Answer key
 - Standard of success to be used for this assessment: 70% of students will score 70% or higher.
 - Who will score and analyze the data: Departmental faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
9	8

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Not all enrolled students were assessed because some students dropped or withdrew from the course.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students in a single section were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Blackboard quiz was administered. It was a multiple choice exam that has an answer key.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

8 of 8 students scored 70% or higher. This meets the standard of success as 70% of the students scored higher than 70%.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The areas of strength in this area are in the hands-on lab - physically applying the proper techniques of the repair situation to a project, and also applying improper repair techniques to see the results of proper and improper work. Once the students see physical results they are able to retain more information for a written examination of the material.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Obtaining a larger library of different materials to work with to further expand the knowledge base of the student.

Outcome 4: Identify different phase diagrams when dealing with ferrous and nonferrous materials.

- Assessment Plan
 - Assessment Tool: Written exam
 - Assessment Date: Winter 2017
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Answer key

- Standard of success to be used for this assessment: 75% of students will score an average of 80% or higher.
- Who will score and analyze the data: department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
9	8

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Not all enrolled students were assessed because some students dropped or withdrew from the course.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students in a single section were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Blackboard quiz was administered. It was a multiple choice quiz that has an answer key.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No
 The standard of success was not met, as only 37% of the students scored 80% or higher in this exam.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The areas of strength are in the lab portion of this outcome. The students get to utilize the phase diagrams to heat treat material to different strengths and hardnesses. Their ability to see firsthand the effects of heat on the metal helps them understand and remember more of the phase diagram and the procedure of how to use it when it comes to a written examination.

- Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Would like to set forth a standard lab that that walks each student through a heat-treating cycle and what the end results should be. Also, expand the materials to heat treat in combination with welding on these materials.

II. Course Summary and Action Plans Based on Assessment Results

- Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

The two outcomes that didn't meet their standards of success is not entirely a surprise to the department as they are very tough outcomes to meet. This is because the material of the outcomes is very hard to understand - it takes a lot of experience and practice to understand it. A close watch of the quiz and test scores alerts me in each section of this course, which allows me to self-reflect, make changes, and ensure more positive learning for each student who takes this course. When I see low test/quiz scores, adaptive action is taken to ensure learning is taking place.

- Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

As a department, it is known that this particular course is difficult to teach, not only because of the content but the amount of content. As this course is in procession many ideas are exchanged at department meetings - if certain areas are going well or not and ideas on how to proceed with them to make sure the students are getting the most from the course.

- Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Assignments	Would like to create more assignments,	This assessment has shown that students	2017

	labs, and lectures to explain the theories and techniques of identifying different grain structures (outcome #2) and identifying different phase diagrams (outcome #4).	struggle in those two areas the most. Hopefully, increased lectures, labs, and take-home assignments will increase the students' learning in these areas.	
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4. Is there anything that you would like to mention that was not already captured?

The results from outcome 1 are completed in class. Student received completion points if present in class as the instructor works with the each student to ensure understanding and completion of the lab.
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III. Attached Files

[Outcome 2 Statistics](#)

[Outcome 4 statistics](#)

[Outcome 1 Statistics](#)

[Outcome 3 Statistics](#)

Faculty/Preparer: Amanda Scheffler **Date:** 08/01/2017
Department Chair: Glenn Kay II **Date:** 08/17/2017
Dean: Brandon Tucker **Date:** 08/20/2017
Assessment Committee Chair: Michelle Garey **Date:** 12/10/2017