

Pathways for Alternative Energy Automotive Technicians

Course Feedback – Winter Quarter 2019

Prepared for:

Steve Levin
Principal Investigator

Columbus State Community College
550 East Spring Street
Columbus, OH 43215

Prepared by:

The Rucks Group, LLC
714 E. Monument Avenue
Dayton, OH 45402

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Background

Columbus State Community College (Columbus State) was awarded a grant from the National Science Foundation to create an Alternative Energy Automotive Technology career pathway. As part of this project, the team at Columbus State has modified four of its existing Automotive Technology courses and created two new courses to prepare students for success in obtaining professional certifications and entry-level positions in alternative automotive technology. These courses include the following:

- AUTO 1106 - Auto Shop Orientation and Service
- AUTO 1160 - Electrical Systems: Theory & Operation I
- AUTO 1180 - Engine Performance: Theory & Operation I
- AUTO 2280 - Engine Performance: Theory & Operation II
- AUTO 2390 - Advanced Hybrid Vehicles
- AUTO 2391 - Advanced Alternative Fueled Vehicles

At the end of the January – March 2019 term, students enrolled in these courses were asked to complete a brief survey to assess whether they have obtained the knowledge and skills needed to pass their certification exams and whether they feel better prepared to succeed in an entry-level automotive technician position (see Appendix A for a copy of the full survey).

Thirty-one students from four of the automotive technician courses completed the survey. This brief report provides a descriptive summary of the findings.

Respondents were distributed across the following four courses.

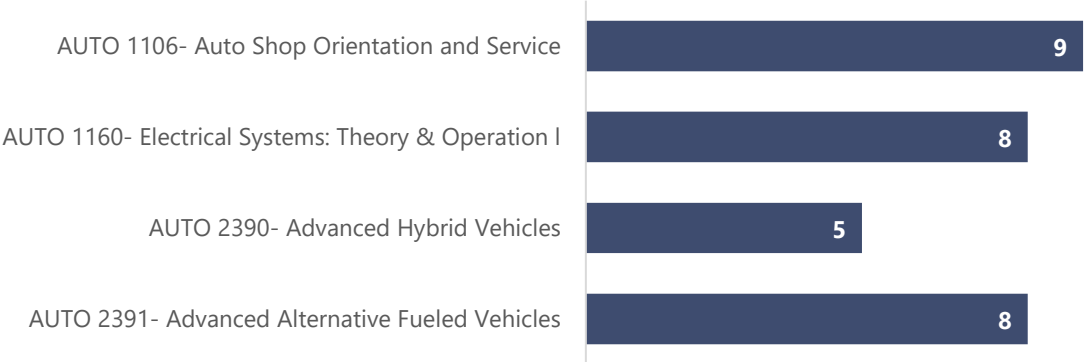


Figure 1. Frequency distribution of respondents by course.

Findings

The first questions asked students to rate their agreement with statements related to their knowledge of the industry, the automotive technician role, and their confidence in their abilities. Respondents were asked to rate what their agreement would have been before the course and now after the course.

Agreement ratings increased for each item across all courses with the largest increases for students in AUTO 1106 and 1160.

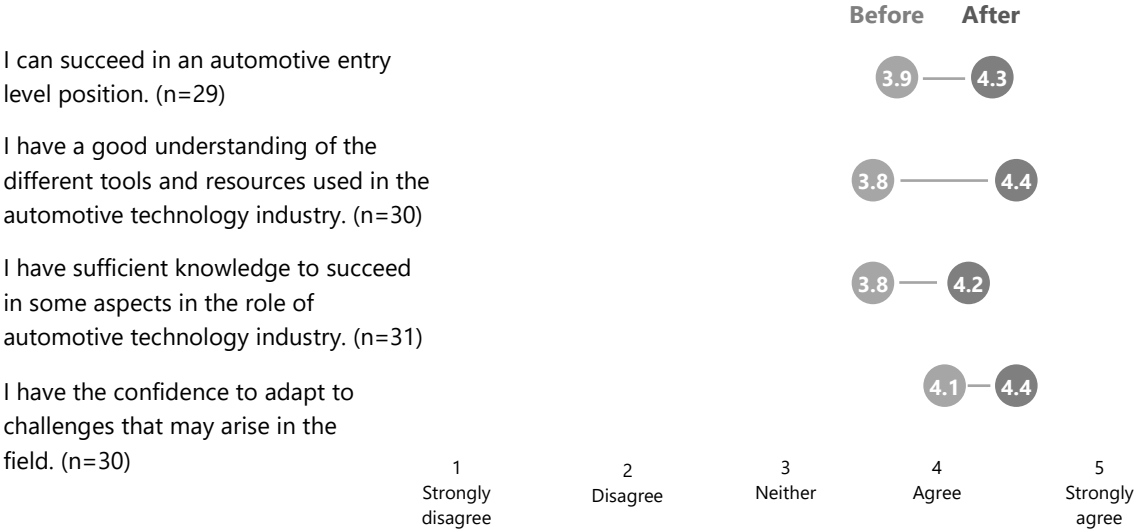


Figure 2. Mean agreement ratings across all courses for the question, “Respond to the following items by first by thinking of how much you agree with the statement BEFORE taking this Automotive Technology course and then how much you agree with the statement AT THIS TIME.”

| | Course | n | Before | After | Change |
|--|-----------|---|--------|-------|--------|
| I can succeed in an automotive entry level position. | AUTO 1106 | 9 | 3.4 | 3.9 | .5 |
| | AUTO 1160 | 7 | 2.8 | 4.0 | 1.2 |
| | AUTO 2390 | 5 | 4.8 | 5.0 | .2 |
| | AUTO 2391 | 8 | 4.6 | 4.7 | .1 |
| I have a good understanding of the different tools and resources used in the automotive technology industry. | AUTO 1106 | 9 | 3.1 | 4.1 | 1 |
| | AUTO 1160 | 7 | 2.9 | 3.9 | 1 |
| | AUTO 2390 | 5 | 4.6 | 5.0 | .4 |
| | AUTO 2391 | 8 | 4.6 | 4.8 | .2 |
| I have sufficient knowledge to succeed in some aspects of an automotive technician role. | AUTO 1106 | 9 | 3.2 | 3.9 | .7 |
| | AUTO 1160 | 7 | 3.0 | 3.7 | .7 |
| | AUTO 2390 | 5 | 4.6 | 4.8 | .2 |
| | AUTO 2391 | 8 | 4.6 | 4.6 | 0 |
| I have the confidence to adapt to challenges that may arise in the field. | AUTO 1106 | 9 | 3.6 | 4.0 | .4 |
| | AUTO 1160 | 7 | 3.6 | 4.1 | .5 |
| | AUTO 2390 | 5 | 5.0 | 5.0 | 0 |
| | AUTO 2391 | 8 | 4.5 | 4.6 | .1 |

Table 1. Mean agreement ratings across all courses and per course in response for the question, “Respond to the following items by first by thinking of how much you agree with the statement BEFORE taking this Automotive Technology course and then how much you agree with the statement AT THIS TIME.”

What, if anything, was particularly helpful about this course in terms of preparing you for an entry-level position in Automotive Technology?

| | |
|--|--|
| <p>AUTO 1106 Auto Shop Orientation and Service</p> | <p>Knowledge gained</p> <ul style="list-style-type: none"> • Gaining basic shop knowledge • Having a better understanding of the basics of all automotive systems • Knowledge from instructors <p>Hands-on learning/labs</p> <ul style="list-style-type: none"> • Labs • The hands-on lab <p>MISC</p> <ul style="list-style-type: none"> • The way that one can navigate the program is simple. It makes things easy. • Shop key certification |
| <p>AUTO 1160 Electrical Systems: Theory & Operation I</p> | <p>Knowledge gained</p> <ul style="list-style-type: none"> • A better understanding of how electricity works on autos. • Proper diagnostics in electrical. <p>Hands-on learning/labs</p> <ul style="list-style-type: none"> • The hands-on aspect. • Hands-on work • Hands-on learning with the DMM. <p>MISC</p> <ul style="list-style-type: none"> • Everything • Using multimeters, using wiring diagrams • The snap-on meter |
| <p>AUTO 2390 Advanced Hybrid Vehicles</p> | <p>Knowledge gained</p> <ul style="list-style-type: none"> • Learning safety precautions and different tools for working on Hybrids. • Knowing the different hybrid and EV systems is helpful, also knowing the different tools needed to work on them. • Understanding high voltage battery diagrams <p>Hands-on learning/labs</p> <ul style="list-style-type: none"> • Having hands-on experience replacing components <p>MISC</p> <ul style="list-style-type: none"> • Advanced level course • L3 prep was very useful |
| <p>AUTO 2391 Advanced Alternative Fueled Vehicles</p> | <p>MISC</p> <ul style="list-style-type: none"> • Different types of alt. fuels • F1 prep |
| <p>Course unspecified</p> | <p>MISC</p> <ul style="list-style-type: none"> • Getting to see the different types of tools you use at the PPE you will need was helpful. |

Table 2. Responses to the open-ended question, "What, if anything, was particularly helpful about this course in terms of preparing you for an entry-level position in Automotive Technology?"

| What-if anything-would you change about this course to make it more helpful? | |
|--|---|
| AUTO 1106 Auto Shop Orientation and Service | <p>Longer course - more time on the topic</p> <ul style="list-style-type: none"> I would make it a longer class so people can understand things better. <p>More hands-on learning/labs</p> <ul style="list-style-type: none"> More lab time. <p>MISC</p> <ul style="list-style-type: none"> More online video resources. <p>Nothing or N/A (3)</p> |
| AUTO 1160 Electrical Systems: Theory & Operation I | <p>Longer course - more time on the topic</p> <ul style="list-style-type: none"> Spend more time on each topic. More on the car situations. <p>More hands-on learning/labs</p> <ul style="list-style-type: none"> More hands on. More lab time. <p>MISC</p> <ul style="list-style-type: none"> Less death by PowerPoint. <p>Nothing or N/A (1)</p> |
| AUTO 2390 Advanced Hybrid Vehicles | <p>More hands-on learning</p> <ul style="list-style-type: none"> Have more hands on work with hybrid systems. Some more challenging bugs. More hands-on diagnostics and testing. <p>Nothing or N/A (2)</p> |
| AUTO 2391 Advanced Alternative Fueled Vehicles | <p>Longer course - more time on topic</p> <ul style="list-style-type: none"> Make it longer. <p>More hands-on learning/labs</p> <ul style="list-style-type: none"> More hands-on. <p>MISC</p> <ul style="list-style-type: none"> More engagement with students. More common/west part. <p>Nothing or N/A (1)</p> |
| Course unspecified | <p>Longer course - more time on topic</p> <ul style="list-style-type: none"> Would change length of class. |

Table 3. Responses to the open-ended question, "What, if anything, would you change about this course to make it more helpful?"

Most AUTO 1106 and 1160 students completed or are preparing to complete their ShopKey Pro Service certification. Most 1160 students also completed their 596 Multimeter Certification.

| | AUTO 1106 - Auto Shop Orientation and Service (n=9) | | AUTO 1160- Electrical Systems: Theory & Operation I (n=7) | |
|--|---|-----------------------|---|-----------------------|
| | Completed | Preparing to complete | Completed | Preparing to complete |
| 596 Multimeter Certification | - | 2 | 7 | 1 |
| Verus Edge Navigation & Scanner Operation Certification | - | 2 | - | 2 |
| ShopKey Pro Service & Repair Information Level I Certification | 8 | - | 5 | 2 |
| Verus Edge Lab Scope Operation & Data Management Certification | - | 1 | - | 2 |
| Totals | 8 | 5 | 12 | 7 |

Figure 3. Response frequencies for all respondents to the question, “Please indicate any certifications you are preparing for – or have completed – during this term.” This question was only asked of students enrolled in AUTO 1106 and 1160.

After the course, most AUTO 1106 and 1160 students “Strongly agree” or “Agree” that they have the ability to learn the material for their certification.

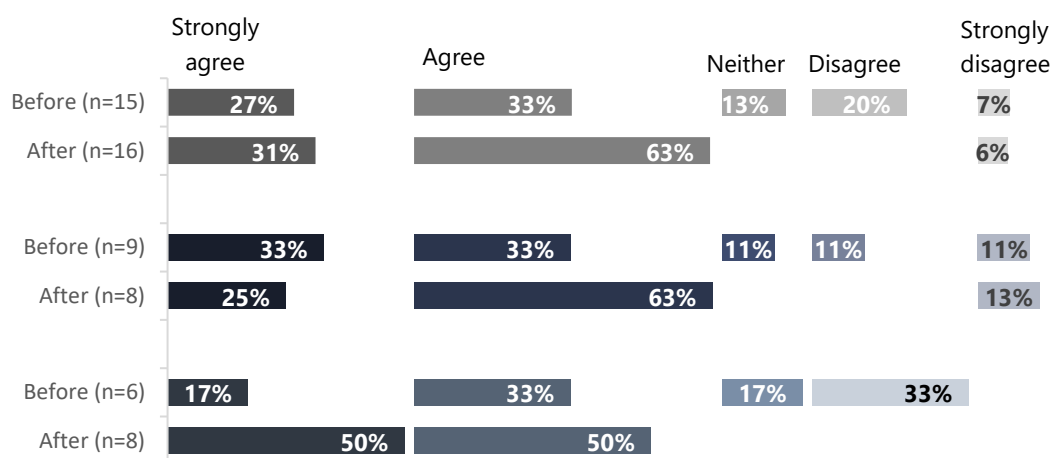


Figure 4. Response frequencies for all respondents to the question, “I am confident I have the ability to learn the material for my certification.” This question was only asked of students enrolled in AUTO 1106 and 1160.

Most AUTO 1106 and 1160 students “Strongly agree” or “Agree” that they are confident they can do well on their certification.

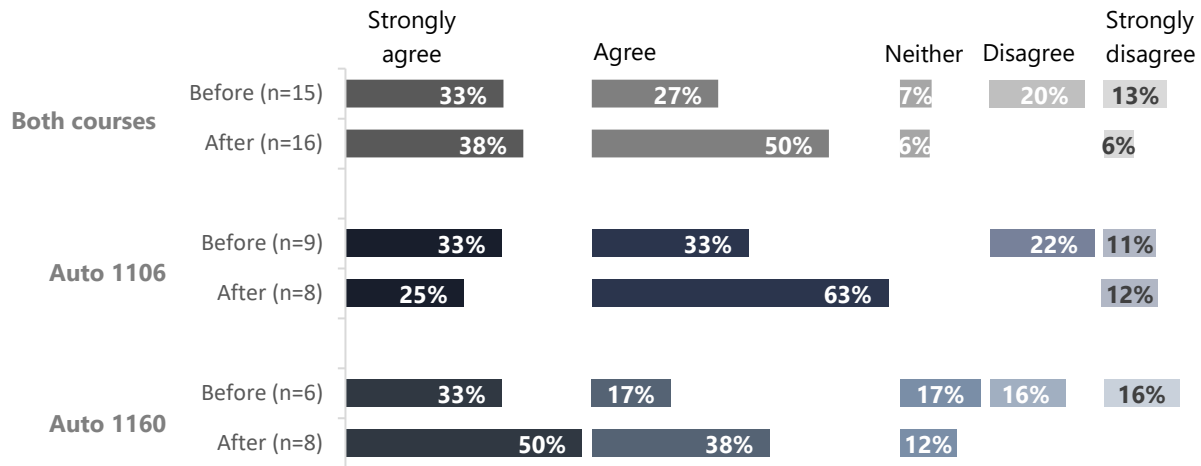


Figure 5. Response frequencies for all respondents to the question, “I am confident I can do well on my certification.” This question was only asked of students enrolled in AUTO 1106 and 1160.

| What - if anything - would you change about this course to help you feel better prepared to do well on your certification? | |
|--|---|
| AUTO 1106 Auto Shop Orientation and Service | <p>More time on the topic</p> <ul style="list-style-type: none"> I would have more time spent on ShopKey. So everybody can really understand it. <p>More hands-on learning/labs</p> <ul style="list-style-type: none"> Have more hands-on work. No “death by powerpoint” pretty much everyone in classes like this learns with more hands-on. <p>MISC</p> <ul style="list-style-type: none"> The wording of the questions can be vague and difficult to understand. <p>Nothing or N/A (3)</p> |
| AUTO 1160 Electrical Systems: Theory & Operation I | <p>More hands-on learning/labs</p> <ul style="list-style-type: none"> More lab time. <p>MISC</p> <ul style="list-style-type: none"> More information in the booklet. More work with foundations of DMM beyond amps, ohms, or volts. |

Table 4. Responses to the open-ended question, “What - if anything - would you change about this course to help you feel better prepared to do well on your certification?”

After the course, most AUTO 2390 and 2391 students “Strongly agreed” or “Agreed” that they are confident they can pass the portion of the ACE Certification Test associated with the course.

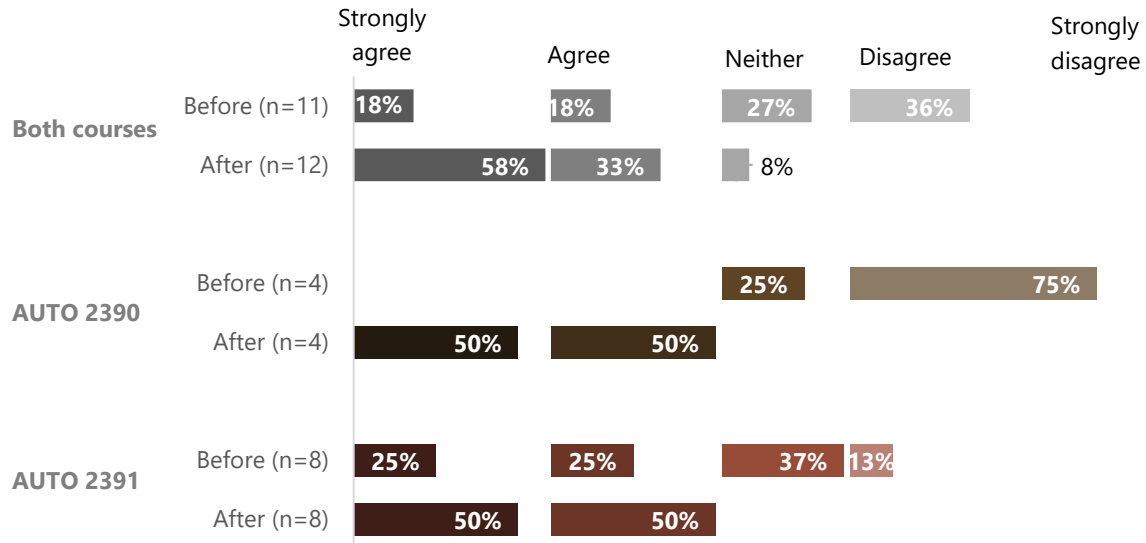


Figure 6. Response frequencies for all respondents to the question, “I am confident that I could pass portion of the ASE Certification Test that is associated with this course.” This question was only asked of students enrolled in AUTO 2390 and 2391.

After the course, most AUTO 2390 and 2391 students “Strongly agreed” or “Agreed” that the course prepared them well for the portion of the ASE Certification Test associated with the course.

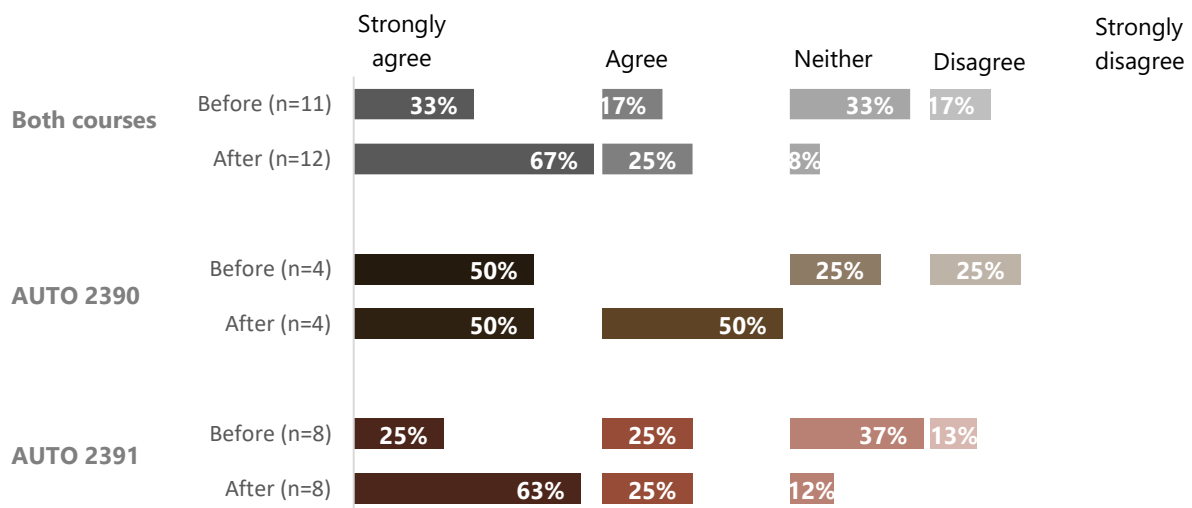


Figure 7. Response frequencies for all respondents to the question, “This course has prepared me well for the portion of the ASE Certification Test that is associated with this course.” This question was only asked of students enrolled in AUTO 2390 and 2391.

| What-if anything-would you change about this course to help you feel better prepared for the ASE Certification Exams? | |
|---|---|
| AUTO 2390 Advanced Hybrid Vehicles | More practice testing <ul style="list-style-type: none"> • Add an ASE practice quiz. • More test questions. Nothing or N/A (2) |
| AUTO 2391 Advanced Alternative Fueled Vehicles | More hands-on learning/labs <ul style="list-style-type: none"> • More hands-on in class. |

Table 5. Responses to the open-ended question, "What-if anything-would you change about this course to help you feel better prepared for the ASE Certification Exams?"

Final Thought

This brief report is intended to provide a clear and concise summary of the Winter Quarter 2019 Automotive course evaluations. The interpretation of this information in relation to this project's evaluation questions along with corresponding recommendations will be included in the annual evaluation report.

Appendix A - Automotive Course Feedback

Columbus State Community College (CSCC) was awarded a grant from the National Science Foundation to modify courses in Automotive Technology. Project planners are interested in finding out information that will help make that program as effective as possible. The questionnaire will take about 3-5 minutes to complete. Your participation is completely voluntary. All responses will be kept strictly anonymous, and individual responses will not be shared. Please read each question carefully and respond candidly.

Indicate the course for which you are completing this survey.

- | | |
|---|--|
| <input type="checkbox"/> AUTO 1106 - Auto Shop Orientation and Service | <input type="checkbox"/> AUTO 2280 - Engine Performance: Theory & Operation II |
| <input type="checkbox"/> AUTO 1160 - Electrical Systems: Theory & Operation I | <input type="checkbox"/> AUTO 2390 - Advanced Hybrid Vehicles |
| <input type="checkbox"/> AUTO 1180 - Engine Performance: Theory & Operation I | <input type="checkbox"/> AUTO 2391 - Advanced Alternative Fueled Vehicles |

Please indicate how many Automotive Technology courses you have taken prior to this term.

- 1 2 Three or more

The next few questions ask about this specific course.

Respond to the following items by first by thinking of how much you agree with the statement BEFORE taking this Automotive Technology course and then how much you agree with the statement AT THIS TIME

| BEFORE THIS COURSE | | | | | AFTER THIS COURSE | | | | | |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Strongly agree | Agree | Neither | Disagree | Strongly disagree | | Strongly agree | Agree | Neither | Disagree | Strongly disagree |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I can succeed in an automotive entry level position. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I have a good understanding of the different tools and resources used in the automotive technology industry. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I have sufficient knowledge to succeed in some aspects of an automotive technician role. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I have the confidence to adapt to challenges that may arise in the field. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

What, if anything, was particularly helpful about this course in terms of preparing you for an entry-level position in Automotive Technology?

What - if anything - would you change about this course to make it more helpful?

If you are completing this for AUTO 1106, 1160, 1180, or 2280, please answer questions 2.1, 2.2, and 2.3.

2.1 Please indicate any certifications you are preparing for – or have completed - during this term. (If none, then leave blank and turn in your completed survey. Thanks!)

| Preparing for | Completed | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 596 Multimeter Certification |
| <input type="checkbox"/> | <input type="checkbox"/> | Verus Edge Navigation & Scanner Operation Certification |
| <input type="checkbox"/> | <input type="checkbox"/> | ShopKey Pro Service & Repair Information Level I Certification |
| <input type="checkbox"/> | <input type="checkbox"/> | Verus Edge Lab Scope Operation & Data Management Certification |

2.2 Respond to the following items by first by thinking of how much you would have agreed with the statement BEFORE taking this course and then how much you agree with the statement AT THIS TIME.

| <i>BEFORE TAKING THIS COURSE</i> | | | | | <i>AFTER TAKING THIS COURSE</i> | | | | | |
|----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|
| Strongly agree | Agree | Neither | Disagree | Strongly disagree | | Strongly agree | Agree | Neither | Disagree | Strongly disagree |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | ← | | | | | → |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | I am confident I have the ability to learn the material for my certification. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | I am confident I can do well on my certification. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

2.3 What - if anything - would you change about this course to help you feel better prepared to do well on your certification.

If you are completing this for AUTO 2390 or 2391, please answer questions 3.1 and 3.2

3.1 Respond to the following items by first by thinking of how much you would have agreed with the statement BEFORE taking this course and then how much you agree with the statement AT THIS TIME.

| <i>BEFORE TAKING THIS COURSE</i> | | | | | <i>AFTER TAKING THIS COURSE</i> | | | | | |
|----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|
| Strongly agree | Agree | Neither | Disagree | Strongly disagree | | Strongly agree | Agree | Neither | Disagree | Strongly disagree |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | ← | | | | | → |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | I am confident that I could pass the portion of the ASE Certification Exam that is associated with this course. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | This course has prepared me well for the portion of the ASE Certification Exam that is associated with this course. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

3.2 What - if anything - would you change about this course to help you feel better prepared for the ASE Certification Exam?