Grossmont-Cuyamaca College Community District
Articulation Agreement

High School Course	Credits	College Course	Units
MLR – 3 Maintenance and Light Repair Level 3	10.0	Auto 99 Auto 100	3.0 1.0

High school(s): Ramona High School	College: Cuyamaca College

1. **Course Prerequisites**
   None

2. **Recommended Preparation**
   MLR – 1 Maintenance and Light Repair Level 1 with a grade of B or better for both semesters.
   MLR – 2 Maintenance and Light Repair Level 2 with a grade of B or better for both semesters.

3. **College Course Description**
   A. Auto 99 presents basic information about automotive systems. Serves as a recommended preparation course for students interested in the Automotive Technology major.
   B. Auto 100 provides a basic laboratory environment designed to prepare students for entry into the Automotive Technology major. Covers repairing, servicing and basic diagnostic procedures of a typical passenger car or light truck.

4. **Required Content for Articulation**

A. Introduction, orientation, safety and tool I.D.	A-0	3 weeks
B. Engine performance and diagnostics	A-8	6 weeks
C. Measurements	A-1	1 week
D. Service and computer manuals	A-1	2 weeks
E. Electrical principles/systems	A-6	4 weeks
F. Suspension systems and alignments	A-4	5 weeks
G. Tire/wheel service	A-4	2 weeks
H. Brake system and diagnosis	A-5	6 weeks
I. Open lab for completion of MLR tasks		4 weeks
J. ASE testing and finals		3 weeks

5. **Required Competencies (SLOs) for Articulation**

At the conclusion of this course, the student will be able to:

A. Demonstrate at the 100% level of competency on a written safety test and complete SP-2 online safety training program.

B. Apply knowledge of basic tools, specialized tools, and equipment needed for services, maintenance, and repairs. Practice safe shop practices.

C. Understand cooling and lubrication systems and related problems.

D. Demonstrate service tasks to Automatic and Manual transmissions, Axle service.

E. Understand basic alignment angles, alignment adjustments, suspension service. Wheel and tire service, Understand Tire pressure monitoring systems.

F. Be able to perform brake diagnosis and repairs.

G. Demonstrate electrical principles through testing and diagnosis of electrical problems.

H. Understand Heating and Air conditioning systems.

I. Understand and troubleshoot ignition system, emission systems and diagnostic procedures.

6. Assessment Methods

A grading system will be established and uniformly implemented by the instructor. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

A. Tests (objective)
B. Projects
C. Final exam (objective, essay)

7. RUBRIC: Attached (if applicable)

8. Texts and other supporting materials (software, etc.)

A. Basic Text
Modern Automotive Technology, 2000 Author: James E. Duffy;
Publisher: Goodheart Wilcox

B. Supplemental texts
CDX Online- MLR program.

C. Other
1. SP2 online safety program and certificates
2. NC3 Training and certificates
3. ProDemand online repair information
4. Reference Materials- Factory manuals
5. Workbooks

9. **Criteria for Course Articulation**
   A. High school and college teachers attend articulation meetings to determine curriculum alignment and articulation competency rubric.
   B. Student must pass high school course with a grade of "B" or better and have mastered course competencies as identified in the articulation competency rubric.

Agreement was based on Statewide Career Pathways Project Template: Yes _x_ No ____

Articulation meeting held: 11/28/2018

Effective date: Fall 2018 Expiration date: December 1, 2021

High School/CTE/Signatures

6-19-19
Teacher Date

Robert Grace
Teacher (print name)

Antoinette Rocky 6/19/19
Principal Date

Ramona High School
High School

Teacher Date

Teacher (print name)

Principal Date

High School

College Signatures

6-24-19
Instructor/Program Chair, Cuyamaca Date

Brad M Combs
Instructor/Program Chair (print name)

6-26-19
Dean of Career Education, Cuyamaca Date

Instructor/Program Chair, Grossmont Date

Instructor/Program Chair (print name)

Dean of Career Education, Grossmont Date

Board Approved: 6/29/17
RUSD Course # 5261
CALPADS # 5665

COURSE OF STUDY

Ramona Unified School District

COURSE TITLE:	AUTO TECHNOLOGY – Maintenance and Light Repair Level 1 (MLR 1)
DEPARTMENT:	Career and Technology Education
YEAR:	2017-2018
COURSE LENGTH:	One Year
CREDITS:	10
CREDIT TYPE:	Elective
GRADE LEVEL:	10 - 12
PREREQUISITES:	Power Equipment Technology (suggested)

1.0 BRIEF DESCRIPTION OF THE COURSE

This course develops automotive knowledge and provides basic level training in servicing and maintenance of motor vehicles. Areas of training include of Safety and Foundation A0, Engine Repair A1, Automatic Transmission A2, Manual Transmission A3, Steering and Suspension A4, Brakes A5, Electrical A6, Heating and Air Conditioning A7, and Engine Performance A8. Topics are aligned to the National Automotive Technician Education Foundation (NATEF) Maintenance and Light Repair (MLR) requirements. English language arts are reinforced. Work-based learning strategies appropriate for this course include: apprenticeship, cooperative education, entrepreneurship, internship, and job shadowing. Skills-USA competitive events, community service and leadership activities provide the opportunity to apply essential standards and workplace readiness skills through authentic experiences. This course has about 40% shop/lab time. All courses in the MLR program are taught by an industry certified (ASE) instructor. This is the first course in the CTE pathway for System Diagnostics, Services and Repair.

Approximately 180 hours are needed to complete the course. Many of the MLR tasks will be level P-1 in this course. 540 hours to complete the entire MLR pathway. MLR 1 fulfills elective graduation requirements.

Students will prepare for on-the-job training as part of this course. Students must meet required course standards and obtain permission of the instructor prior to an on-the-job training assignment. Students must conform to dress codes and other standards required by the training site management.

2.0 MAJOR GOALS AND OBJECTIVES OF THE COURSE

At the conclusion of this course, the student will be able to:

2.1 Demonstrate at the 100% level of competency on a written safety test and complete SP-2 online safety training program.

C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
C1.1 Know and understand common environmental conservation practices and their applications.
C1.2 Practice the safe handling and storage of chemicals and hazardous wastes in accordance with Material Safety Data Sheets (MSDS) and the requirements of local, state, and federal regulatory agencies.
C1.3 Understand the way in which waste gasses, emissions, and other environmentally destructive substances are generated and the effects of these substances on the environment.
C1.4 Use appropriate personal protective equipment and safety practices.
C4.2 Demonstrate how to properly document maintenance and repair procedures in accordance with applicable rules, laws, and regulations (e.g., Bureau of Auto Repair [BAR], Occupational Safety and Health Administration [OSHA], and the California Air Resources Board [ARB]).

2.2 Apply knowledge of basic tools, specialized tools, and equipment needed for services, maintenance, and repairs.

C1.4 Use appropriate personal protective equipment and safety practices.
C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
C2.1 Recognize the importance of calibration processes, systems, and techniques using various measurement and testing devices.
C2.2 Demonstrate and use appropriate tools and equipment—such as wrenches, sockets, and pliers—to diagnose, service, repair, and maintain systems and components.
C2.3 Use tools, equipment, and machines to safely measure, test, diagnose, and analyze components and systems (e.g., electrical and electronic circuits, alternating- and direct-current applications, fluid/hydraulic and air/pneumatic systems).
C2.4 Select and use the appropriate measurement device(s) and use mathematical functions necessary to perform required fabrication, maintenance, and operation procedures.

2.3 Understand the many career options available.

C4.2 Demonstrate how to properly document maintenance and repair procedures in accordance with applicable rules, laws, and regulations (e.g., Bureau of Auto Repair [BAR], Occupational Safety and Health Administration [OSHA], and the California Air Resources Board [ARB]).
C4.4 Complete a work order, including customer information, description of repairs, and billing information, in accordance with applicable rules, laws, and regulations.
C5.0 Apply and understand appropriate business practices.
C5.1 Identify work-related systems common to the transportation service industry.

C5.2 Know the laws and regulations applicable to recordkeeping and the appropriate handling and disposal of hazardous materials.
C5.3 Explain the importance of and the procedures for maintaining accurate records (e.g., business licenses, repair orders, billing and tax records).

2.4 Demonstrate measurement instruments in both metric and standard micrometers.

C2.1 Recognize the importance of calibration processes, systems, and techniques using various measurement and testing devices.
C2.5 Use measurement scales, devices, and systems, such as dial indicators and micrometers, to design, fabricate, diagnose, maintain, and repair vehicles and components following recommended industry standards.
C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
C2.7 Test and analyze the elements of precision measuring using standard and metric systems.

2.5 Understand the usage of service manuals and computer information systems.

C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
C4.0 Perform and document maintenance procedures in accordance with the recommendations of the manufacturer.
C4.3 Use reference books, technical service bulletins, and other documents and materials related to the service industry available in print and through electronic retrieval systems to accurately diagnose and repair systems, equipment, and vehicles.

2.6 Demonstrate electrical principles through testing and diagnosis of electrical problems.

C6.3 Practice how to maintain, diagnose, and repair computerized engine control systems and other engine-related systems.
C6.4 Maintain, diagnose, service, and repair ignition, electronic, and computerized engine controls and fuel management systems.
C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.
C7.1 Practice maintenance, diagnosis, and repair of electrical systems.

2.7 Be able to perform vehicle maintenance and fluid service.

C6.0 Demonstrate the application, operation, maintenance, and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems.
C6.1 Perform general engine maintenance, diagnosis, service, and repair in accordance with portable national industry standards, such as the National Automotive Technicians Education Foundation and the Equipment and Engine Training Council.
C6.2 Maintain, diagnose, service, and repair lubrication and cooling systems.

2.8 Demonstrate battery service and testing.

C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.
C7.1 Practice maintenance, diagnosis, and repair of electrical systems.
C7.2 Maintain, diagnose, repair, and service batteries.

2.9 Understand and troubleshoot ignition system and problems.

C4.3 Use reference books, technical service bulletins, and other documents and materials related to the service industry available in print and through electronic retrieval systems to accurately diagnose and repair systems, equipment, and vehicles.
C5.6 Recognize, analyze, and evaluate the need for maintenance of components and systems and the conditions under which service and maintenance are required.
C6.4 Maintain, diagnose, service, and repair ignition, electronic, and computerized engine controls and fuel management systems.
C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.
C7.1 Practice maintenance, diagnosis, and repair of electrical systems.

2.10 Understand cooling and lubrication systems and problems.

C6.0 Demonstrate the application, operation, maintenance, and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems.
C6.1 Perform general engine maintenance, diagnosis, service, and repair in accordance with portable national industry standards, such as the National Automotive Technicians Education Foundation and the Equipment and Engine Training Council.
C6.2 Maintain, diagnose, service, and repair lubrication and cooling systems.

2.11 Be able to perform brake inspections and repairs.

C8.0 Demonstrate the function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with national industry standards.
C8.1 Describe how to maintain, diagnose, service, and repair hydraulic and power assist systems.
C8.3 Diagnose, service, and repair disc brakes, drum brakes, antilock brakes, and other brake systems as developed.

2.12 Understand basic alignment angles and adjustments.

C8.4 Diagnose, service, and repair steering and suspension systems.

2.13 Be able to perform tire installation and balance.

C8.5 Interpret tire and rim sizing to select appropriate wheels and tires for vehicles.
C8.6 Maintain, diagnose, service, and repair under-vehicle systems and malfunctions.

3.0 COURSE CONTENT AND SUGGESTED TIME

3.1	Introduction, orientation, safety and tool I.D.	3 weeks
3.2	Careers	1 week
3.3	Measurements	2 weeks
3.4	Service and computer manuals	2 weeks
3.5	Electrical principles	3 weeks
3.6	Vehicle maintenance	2 weeks
3.7	Battery service and testing	2 weeks
3.8	Ignitions system	3 weeks
3.9	Cooling and lubrication	2 weeks
3.10	Brake system	4 weeks
3.11	Suspension systems	4 weeks
3.12	Tires/wheels	2 weeks
3.13	Finals	2 weeks

4.0 TYPICAL ACTIVITIES

4.1 Reading of texts, reference, service bulletins, and factory manuals.
4.2 Answering questions from text, instructor developed tests and instructor oral questions.
4.3 Writing-up work orders.
4.4 Inspecting, disassembling and reassembling components.
4.5 Active listening.

5.0 MEANS AND METHODS OF EVALUATION

5.1 Unit pretests and posttests.
5.2 CDX in unit quizzes.
5.3 Task evaluation.
5.4 Final exams.

6.0 MATERIALS

6.1 Basic Text

6.1.1 Modern Automotive Technology, 2000
Author: James E. Duffy
Publisher: Goodheart Wilcox

6.2 Supplemental texts
6.2.1 CDX Online- MLR program
6.3 Other
6.2.1 SP2 online safety program and certificates

6.2.2 NC3 Training and certificates
6.2.3 ProDemand online repair information
6.2.4 Reference Materials- Factory manuals
6.2.5 Workbooks

Approved by:

_____ _____
Department Chair Date

_____ _____
Principal Date

Board Approved Date: June 29, 2017

Board Approved: 6/29/17
RUSD Course # 5262
CALPADS # 5668

COURSE OF STUDY

Ramona Unified School District

COURSE TITLE:	AUTO TECHNOLOGY – Maintenance and Light Repair Level 2 (MLR 2)
DEPARTMENT:	Career and Technology Education
YEAR:	2017 - 2018
COURSE LENGTH:	One Year
CREDITS:	10
CREDIT TYPE:	Elective
GRADE LEVEL:	11 - 12
PREREQUISITES:	Maintenance and Light Repair 1 (MLR 1) or Instructor approval

1.0 BRIEF DESCRIPTION OF THE COURSE

This course furthers the automotive knowledge and provides higher level training in servicing and maintenance of motor vehicles with higher difficultly repair tasks and diagnostics. Areas of training include of Safety and Foundation A0, Engine Repair A1, Automatic Transmission A2, Manual Transmission A3, Steering and Suspension A4, Brakes A5, Electrical A6, Heating and Air Conditioning A7, and Engine Performance A8. Topics are aligned to the National Automotive Technician Education Foundation (NATEF) Maintenance and Light Repair (MLR) requirements. English language arts are reinforced. Work-based learning strategies appropriate for this course include: apprenticeship, cooperative education, entrepreneurship, internship, and job shadowing. Skills-USA competitive events, community service, and leadership activities provide the opportunity to apply essential standards and workplace readiness skills through authentic experiences. This Level 2 course is 60% hands on learning. All courses in the MLR program are taught by an industry certified (ASE) instructor. This is the second course in the CTE pathway for System Diagnostics, Services and Repair.

Approximately 180 hours are needed to complete the course. Many of the MLR tasks will be levels P-1, P-2, and some P-3 in this course. 540 hours to complete the entire MLR pathway. MLR 2 fulfills elective graduation requirements.

Students will prepare for on-the-job training as part of this course. Students must meet required course standards and obtain permission of the instructor prior to an on-the-job training assignment. Students must conform to dress codes and other standards required by the training site management.

2.0 MAJOR GOALS AND OBJECTIVES OF THE COURSE

At the conclusion of this course, the student will be able to:

2.1 Demonstrate at the 100% level of competency on a written safety test and complete SP-2 online safety training program. A-0

C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
C1.1 Know and understand common environmental conservation practices and their applications.
C1.2 Practice the safe handling and storage of chemicals and hazardous wastes in accordance with Material Safety Data Sheets (MSDS) and the requirements of local, state, and federal regulatory agencies.
C1.3 Understand the way in which waste gasses, emissions, and other environmentally destructive substances are generated and the effects of these substances on the environment.
C1.4 Use appropriate personal protective equipment and safety practices.
C4.2 Demonstrate how to properly document maintenance and repair procedures in accordance with applicable rules, laws, and regulations (e.g., Bureau of Auto Repair [BAR], Occupational Safety and Health Administration [OSHA], and the California Air Resources Board [ARB]).

2.2 Apply knowledge of basic tools, specialized tools, and equipment needed for services, maintenance, and repairs. Practice safe shop practices. A-0

C1.4 Use appropriate personal protective equipment and safety practices.
C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
C2.1 Recognize the importance of calibration processes, systems, and techniques using various measurement and testing devices.
C2.2 Demonstrate and use appropriate tools and equipment—such as wrenches, sockets, and pliers—to diagnose, service, repair, and maintain systems and components.
C2.3 Use tools, equipment, and machines to safely measure, test, diagnose, and analyze components and systems (e.g., electrical and electronic circuits, alternating- and direct-current applications, fluid/hydraulic and air/pneumatic systems).
C2.4 Select and use the appropriate measurement device(s) and use mathematical functions necessary to perform required fabrication, maintenance, and operation procedures.

2.3 Understand cooling and lubrication systems and related problems. A-1

C6.0 Demonstrate the application, operation, maintenance, and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems.
C6.1 Perform general engine maintenance, diagnosis, service, and repair in accordance with portable national industry standards, such as the National Automotive Technicians Education Foundation and the Equipment and Engine Training Council.
C6.2 Maintain, diagnose, service, and repair lubrication and cooling systems.

2.4 Demonstrate service tasks to Automatic and Manual transmissions, Axle service. A-2 & A3

- C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
- C2.7 Test and analyze the elements of precision measuring using standard and metric systems.
- C8.2 Describe the function and operation of automatic and manual transmissions and transaxles.

2.5 Understand basic alignment angles, alignment adjustments, suspension service. Wheel and tire service, Understand Tire pressure monitoring systems. A-4

- C8.4 Diagnose, service, and repair steering and suspension systems.
- C8.5 Interpret tire and rim sizing to select appropriate wheels and tires for vehicles.
- C8.6 Maintain, diagnose, service, and repair under-vehicle systems and malfunctions.

2.6 Be able to perform brake diagnosis and repairs. A-5

- C8.0 Demonstrate the function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with national industry standards.
- C8.1 Describe how to maintain, diagnose, service, and repair hydraulic and power assist systems.
- C8.3 Diagnose, service, and repair disc brakes, drum brakes, antilock brakes, and other brake systems as developed.

2.7 Demonstrate electrical principles through testing and diagnosis of electrical problems. A-6

- C6.3 Practice how to maintain, diagnose, and repair computerized engine control systems and other engine-related systems.
- C6.4 Maintain, diagnose, service, and repair ignition, electronic, and computerized engine controls and fuel management systems.
- C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.
- C7.1 Practice maintenance, diagnosis, and repair of electrical systems.
- C7.2 Maintain, diagnose, repair, and service batteries.

2.8 Understand Heating and Air conditioning systems. A-7

- C7.5 Diagnose, service, and repair heating and air-conditioning systems and components.

2.9 Understand and troubleshoot ignition system, emission systems and diagnostic procedures. A-8

C4.3 Use reference books, technical service bulletins, and other documents and materials related to the service industry available in print and through electronic retrieval systems to accurately diagnose and repair systems, equipment, and vehicles.

C5.6 Recognize, analyze, and evaluate the need for maintenance of components and systems and the conditions under which service and maintenance are required.

C6.3 Practice how to maintain, diagnose, and repair computerized engine control systems and other engine-related systems.

C6.4 Maintain, diagnose, service, and repair ignition, electronic, and computerized engine controls and fuel management systems.

C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.

C7.1 Practice maintenance, diagnosis, and repair of electrical systems.

C7.7 Perform necessary procedures to maintain, diagnose, service, and repair vehicle electrical and electronic systems and malfunctions.

3.0 COURSE CONTENT AND SUGGESTED TIME

3.1	Introduction, orientation, safety and tool I.D.	A-0	3 weeks
3.2	Engine repair and service	A-1	4 weeks
3.3	Measurements	A-1	1 week
3.4	Service and computer manuals	A-1	2 weeks
3.5	Transmission AT/MT/Axles	A-2&A-3	3 weeks
3.6	Midterm testing		1 week
3.7	Suspension systems and alignments	A-4	3 weeks
3.8	Tire/wheel service	A-4	2 weeks
3.9	Brake system and diagnosis	A-5	4 weeks
3.10	Electrical principles/systems	A-6	4 weeks
3.11	HVAC inspection	A-7	2 weeks
3.12	Engine performance and diagnostics	A-8	4 weeks
3.13	Finals		2 weeks

4.0 TYPICAL ACTIVITIES

4.1 Reading of texts, reference, service bulletins, and factory manuals.

4.2 Answering questions from text, instructor developed tests and instructor oral questions.

4.3 Writing-up work orders and cost estimates.

4.4 Inspecting, disassembling and reassembling components.

4.5 Active listening.

4.6 Part and supply ordering.

4.7 Interviewing the customer.

4.8 Research and presentations.

5.0 MEANS AND METHODS OF EVALUATION

5.1 Unit pretests and posttests.
5.2 CDX in unit quizzes.
5.3 Task evaluations.
5.4 Midterm and Final exams.
5.5 Participation in activities.

6.0 MATERIALS

6.1 Basic Text
- 6.1.1 Modern Automotive Technology, 2000
  Author: James E. Duffy
  Publisher: Goodheart Wilcox

6.2 Supplemental texts
- 6.2.1 CDX Online- MLR program

6.3 Other
- 6.3.1 SP2 online safety program and certificates.
- 6.3.2 NC3 Training and certificates.
- 6.3.3 ProDemand online repair information.
- 6.3.4 Reference Materials- Factory manuals.
- 6.3.5 Workbooks.

Approved by:

_____ _____
Department Chair Date

_____ _____
Principal Date

Date Board Approved: June 29, 2017

Board Approved: 6/29/17
RUSD Course # 5263
CALPADS # 5669

COURSE OF STUDY

Ramona Unified School District

COURSE TITLE:	AUTO TECHNOLOGY – Maintenance and Light Repair Level 3 (MLR 3)
DEPARTMENT:	Career and Technology Education
YEAR:	2017 / 2018
COURSE LENGTH:	1 Year
CREDITS:	10
CREDIT TYPE:	Elective
GRADE LEVEL:	11 - 12
PREREQUISITES:	MLR 2 or Instructor approval

1.0 BRIEF DESCRIPTION OF THE COURSE

This capstone course develops automotive knowledge and provides basic level training in servicing and maintenance of motor vehicles. Areas of training include of Safety and Foundation A0, Engine Repair A1, Automatic Transmission A2, Manual Transmission A3, Steering and Suspension A4, Brakes A5, Electrical A6, Heating and Air Conditioning A7, and Engine Performance A8. Topics are aligned to the National Automotive Technician Education Foundation (NATEF) Maintenance and Light Repair (MLR) requirements. English language arts are reinforced. Work-based learning strategies appropriate for this course include apprenticeship, cooperative education, entrepreneurship, internship, and job shadowing. Skills-USA competitive events, community service, and leadership activities provide the opportunity to apply essential standards and workplace readiness skills through authentic experiences. This course has about 80% shop/lab time. All courses in the MLR program are taught by an industry certified (ASE) instructor.

Approximately 180 hours are needed to complete the course. The MLR 3 tasks will be levels P-1, P-2, and P-3 in this course in order to complete all the required NATEF training tasks. 540 hours to complete the entire MLR pathway. MLR 3 fulfills elective graduation requirements. This program of work prepares students transportation industry employment and for ASE exam student certification, and counts as 1 year of work experience for completers toward ASE Certification.

Students will prepare for on-the-job training as part of this course. Students must meet required course standards and obtain permission of the instructor prior to an on-the-job training assignment. Students must conform to dress codes and other standards required by the training site management.

2.0 MAJOR GOALS AND OBJECTIVES OF THE

At the conclusion of this course, the student will be able to:

2.1 Demonstrate at the 100% level of competency on a written safety test and complete SP-2 online safety training program. A-0

C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
C1.1 Know and understand common environmental conservation practices and their applications.
C1.2 Practice the safe handling and storage of chemicals and hazardous wastes in accordance with Material Safety Data Sheets (MSDS) and the requirements of local, state, and federal regulatory agencies.
C1.3 Understand the way in which waste gasses, emissions, and other environmentally destructive substances are generated and the effects of these substances on the environment.
C1.4 Use appropriate personal protective equipment and safety practices.
C4.2 Demonstrate how to properly document maintenance and repair procedures in accordance with applicable rules, laws, and regulations (e.g., Bureau of Auto Repair [BAR], Occupational Safety and Health Administration [OSHA], and the California Air Resources Board [ARB]).

2.2 Apply knowledge of basic tools, specialized tools, and equipment needed for services, maintenance, and repairs. Practice safe shop practices. A-0

C1.4 Use appropriate personal protective equipment and safety practices.
C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
C2.1 Recognize the importance of calibration processes, systems, and techniques using various measurement and testing devices.
C2.2 Demonstrate and use appropriate tools and equipment—such as wrenches, sockets, and pliers—to diagnose, service, repair, and maintain systems and components.
C2.3 Use tools, equipment, and machines to safely measure, test, diagnose, and analyze components and systems (e.g., electrical and electronic circuits, alternating- and direct-current applications, fluid/hydraulic and air/pneumatic systems).
C2.4 Select and use the appropriate measurement device(s) and use mathematical functions necessary to perform required fabrication, maintenance, and operation procedures.

2.3 Understand cooling and lubrication systems and related problems. A-1

C6.0 Demonstrate the application, operation, maintenance, and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems.
C6.1 Perform general engine maintenance, diagnosis, service, and repair in accordance with portable national industry standards, such as the National Automotive Technicians Education Foundation and the Equipment and Engine Training Council.
C6.2 Maintain, diagnose, service, and repair lubrication and cooling systems.

2.4 Demonstrate service tasks to Automatic and Manual transmissions, Axle service. A-2 & A3

C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
C2.7 Test and analyze the elements of precision measuring using standard and metric systems.
C8.2 Describe the function and operation of automatic and manual transmissions and transaxles.

2.5 Understand basic alignment angles, alignment adjustments, suspension service. Wheel and tire service, Understand Tire pressure monitoring systems. A-4

C8.4 Diagnose, service, and repair steering and suspension systems.
C8.5 Interpret tire and rim sizing to select appropriate wheels and tires for vehicles.
C8.6 Maintain, diagnose, service, and repair under-vehicle systems and malfunctions.

2.6 Be able to perform brake diagnosis and repairs. A-5

C8.0 Demonstrate the function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with national industry standards.
C8.1 Describe how to maintain, diagnose, service, and repair hydraulic and power assist systems.
C8.3 Diagnose, service, and repair disc brakes, drum brakes, antilock brakes, and other brake systems as developed.

2.7 Demonstrate electrical principles through testing and diagnosis of electrical problems. A-6

C6.3 Practice how to maintain, diagnose, and repair computerized engine control systems and other engine-related systems.
C6.4 Maintain, diagnose, service, and repair ignition, electronic, and computerized engine controls and fuel management systems.
C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.
C7.1 Practice maintenance, diagnosis, and repair of electrical systems.
C7.2 Maintain, diagnose, repair, and service batteries.

2.8 Understand Heating and Air conditioning systems. A-7

C7.5 Diagnose, service, and repair heating and air-conditioning systems and components

2.9 Understand and troubleshoot ignition system, emission systems and diagnostic procedures. A-8

C4.3 Use reference books, technical service bulletins, and other documents and materials related to the service industry available in print and through

electronic retrieval systems to accurately diagnose and repair systems, equipment, and vehicles.

C5.6 Recognize, analyze, and evaluate the need for maintenance of components and systems and the conditions under which service and maintenance are required.

C6.3 Practice how to maintain, diagnose, and repair computerized engine control systems and other engine-related systems.

C6.4 Maintain, diagnose, service, and repair ignition, electronic, and computerized engine controls and fuel management systems.

C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.

C7.1 Practice maintenance, diagnosis, and repair of electrical systems.

C7.7 Perform necessary procedures to maintain, diagnose, service, and repair vehicle electrical and electronic systems and malfunctions.

3.0 COURSE CONTENT AND SUGGESTED TIME

3.1	Introduction, orientation, safety and tool I.D.	A-0	3 weeks
3.2	Engine performance and diagnostics	A-8	6 weeks
3.3	Measurements	A-1	1 week
3.4	Service and computer manuals	A-1	2 weeks
3.6	Electrical principles/systems	A-6	4 weeks
3.7	Suspension systems and alignments	A-4	5 weeks
3.8	Tire/wheel service	A-4	2 weeks
3.9	Brake system and diagnosis	A-5	6 weeks
3.10	Open lab for completion of MLR tasks		4 weeks
3.11	ASE testing and finals		3 weeks

4.0 TYPICAL ACTIVITIES

4.1 Reading of texts, reference, service bulletins, and factory manuals.

4.2 Answering questions from text, instructor developed tests and instructor oral questions.

4.3 Writing-up work orders, with costs, and interviewing the customers.

4.4 Inspecting, disassembling and reassembling components.

4.5 Active listening and participation in activities.

4.6 Live work on student and staff vehicles.

4.7 Research of repairs.

5.0 MEANS AND METHODS OF EVALUATION

5.1 Unit pretests and posttests.

5.2 CDX in unit quizzes.

5.3 Task evaluation.

5.4 Final exams.

6.0 MATERIALS

6.1 Basic Text
- 6.1.1 Modern Automotive Technology, 2000
  - Author: James E. Duffy
  - Publisher: Goodheart Wilcox

6.2 Supplemental texts
- 6.2.1 CDX Online- MLR program

6.3 Other
- 6.3.1 SP2 online safety program and certificates.
- 6.3.2 NC3 Training and certificates.
- 6.3.3 ProDemand online repair information.
- 6.3.4 Reference Materials- Factory manuals.
- 6.3.5 Workbooks.

Approved by:

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Department Chair Date

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Principal Date

Date Board Approved: June 29, 2017