Luna Community College

Automotive Technology

Certificate

2017/2018

Luna Community College

Contents

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Auto Technology

Certificate

Minimum of 55 Credit Hours

Program Goals

The program prepares students for the automotive industry. It provides students with the skills needed for a job as an entry-level line technician. It covers the automobile in every area such as chassis systems, electrical systems, fuel systems, climate control systems, drive train systems, and engine repair and engine performance. This program also provides upgrades in skills for technicians already working in the automotive industry. Demonstration of appropriate automotive skills to the faculty advisor is required.

2015/18 Curriculum Profile(click here for link) and Appendix A

The program follows the Automotive Service Excellence (ASE) and National Automotive Technician Education Foundation (NATEF) curriculum standards. Upon completion of this program a student will receive a certificate and may be eligible to take the Automotive Service Excellence (ASE) certification test.

Completion of this certificate can be applied toward the Associate of Applied Science Degree in Vocational/Technical Studies.

Institutional Proficiency Requirements

In addition to the courses listed below for this program of study, students must also complete institutional proficiencies of ENG095, MATH075 and READ095.

Program Map

The program map marks courses that are scheduled by semester in order to complete this degree within two years (or one year if applicable). Refer to Appendix A for the program map.

Professional Development

In the Spring 2018 Instructor Gene Sandoval attended training to study to become a Snap-On certified instructor. Specific Certifications include: John Bean Wheel Balancing Basics, Master Rotor Matching Certification, Wheel Handling, John Bean Alignment Fundamentals, and Wheel Balancer Certification. Gene also renewed his certifications as an Automotive Service Excellence(ASE) Master Automobile Technician, and as an ASE Undercar Specialist.

Courses Offered by Semester

Fall 2017

AUTO100 Automotive Fundamentals	AUTO101 General Automotive Service	AUTO104 Electrical & Elctrnc Systems I
AUTO108 Manual Transmission & Drivetrain	AUTO120 Engine Repair	AUTO135 Brakes
AUTO137 Electrical & Elctrnc Systems II	AUTO154 Steering and Suspension	AUTO295 Automotive Technology Capstone

Spring 2018

AUTO101 General Automotive Service	AUTO104 Electrical & Elctrnc Systems I	AUTO106 Engine Performance I
AUTO124 Heating and Air Conditioning	AUTO128 Automatic Trnsmsns & Drivetrain	AUTO135 Brakes
AUTO154 Steering and Suspension		

Summer 2018

AUTO101 General Automotive Service	

Program Student Enrollment (Three-Year Annual Trend)

2015/2016	2016/2017	2017/18
130	181	144

Retention Rates Fall to Spring

	Total Fall Enrollment #*	Spring Enrollment
2015-16	**56**	**60**
2016-17	**80**	**91**
2017-18	**59**	**82**

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Fall By Course

Course	Credit	# Students Enrolled	Student Credit Hours
AUTO100 Automotive Fundamentals	4	17	68
AUTO101 General Automotive Service	2	18	36
AUTO104 Electrical & Elctrnc Systems I	5	6	30
AUTO108 Manual Transmission & Drivetrain	4	10	40
AUTO120 Engine Repair	5	5	25
AUTO 124 Heating and AC (wasn't offered in the fall)			
AUTO 128 Auto Trans & Drivetrain (wasn't offered in the fall)			
AUTO135 Brakes	4	7	28

AUTO137 Electrical & Elctrnc Systems II	5	6	30
AUTO154 Steering and Suspension	4	9	36
AUTO295 Automotive Technology Capstone	1	4	4

Spring By Course

Course	Credit	# Students Enrolled	Student Credit Hours
AUTO100 Automotive Fundamentals (wasn't offered in the spring)	4		
AUTO101 General Automotive Service	2	13	26
AUTO104 Electrical & Elctrnc Systems I	5	5	30
AUTO106 01 5.0 Engine Performance I	5	10	40
AUTO120 Engine Repair (wasn't offered in the spring)	5		

AUTO 124 Heating and AC (wasn't offered in the fall)	4	10	40
AUTO 128 Auto Trans & Drivetrain (wasn't offered in the fall)	5	4	20
AUTO135 Brakes	4	7	28
AUTO137 Electrical & Elctrnc Systems II (wasn't offered in spring)	5		
AUTO154 Steering and Suspension	4	5	20
AUTO295 Automotive Technology Capstone (wasn't offered in the spring)	1		

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Summer By Course

Course	Credit	# Students Enrolled	Student Credit Hours
AUTO101 General Automotive Service	2	8	16

Student Graduation (Three-Year Annual Trend)

2015/2016	2016/2017	2017/18
4	3	4

Synopsis of Significant Findings

- Program maintains a consistent graduation rate
- Program needs to follow program maps

Program Improvement Plans Implemented or In-Progress

- In process of creating a Snap-On accreditation program
- In process of reducing contact hours to be competitive with other community colleges offering fewer contact hours to help increase retention rates. Changes to be submitted to LCC Curriculum Committee for Approval in FA 2018 semester.

Advisory Committee Work

- Program has an advisory committee that meets once a semester.
- The meetings should be recorded in formal notes that will then be turned in to the Vocational Education office at LCC to be sure they are on file and readily available to the director and the institution.

Student Advisement by Semester

- Instructors act as program advisors and are cognizant about inputting student data on advisement portal.

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Yearly Return on Investment

Revenue

				Total Students	Student Credit Hours	Tier	Tier Funding total (SCH X $199)	Tuition ($38 X # of Students)	Total Revenue	Instructor Cost	63/64 Cost	Profit (Revenue - Costs)
Auto Tech-REVENUE												
			AUTO100	17	68		$13,532	$646	$14,178			
			AUTO101	18	36		$7,164	$684	$7,848			
			AUTO104	6	30		$5,970	$228	$6,198			
			AUTO108	10	40		$7,960	$380	$8,340			
			AUTO120	5	25		$4,975	$190	$5,165			
			AUTO135	7	28		$5,572	$266	$5,838			
			AUTO137	6	30		$5,970	$228	$6,198			
			AUTO154	9	36		$7,164	$342	$7,506			
			AUTO295	4	4		$796	$152	$948			
			AUTO101	13	26		$5,174	$494	$5,668			
			AUTO104	5	30		$5,970	$ 190.00	$6,160			
			AUTO106	10	40		$7,960	$ 380.00	$8,340			
			AUTO135	7	28		5572	$ 266.00	$5,838			
			AUTO154	5	20		3980	$ 190.00	4170			
			AUTO101	8	16		3184	$ 304.00	3488			
			Totals	130	457		$90,943	$4,940	$95,883	$0	$0	$0

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Costs

1718 Costs

FT Instructors	Instructor Salary	Fringe	Operational Costs 63&64	Total Costs
Donnie Adkins	$ 35,282.88	$ 2,456.37	$ 1,110.00	$ 38,849.25
Clarice Bonney	$ 31,926.27	$ 681.72	$ 406.50	$ 33,014.49
Jessica McGee	$ 31,956.79	$ 2,385.10	$ 5,998.00	$ 40,339.89
Joseph Montoya	$ 39,414.66	$ 2,844.57	$ 4,200.00	$ 46,459.23
Gene Sandoval	$ 37,101.10	$ 2,762.02	$ 2,466.00	$ 42,329.12
Germaine Sandoval	$ 38,078.87	$ 2,386.80	$ 406.50	$ 40,872.17
Total	$213,760.57	$ 13,516.58	$ 14,587.00	$ 241,864.15
PT Instructors				
Anthony Baca	$1,300	$ 49.72	$ 2,466.00	$ 3,815.72
Linda Chibante	$ 19,500.00	$ 1,392.00	$ 1,640.00	$ 22,532.00
Michael Jaramillo	$ 1,950.00	$ 126.24	$ 1,110.00	$ 3,186.24
Gilbert Martinez	$ 1,650.00	$ 1,272.87	$ 500.00	$ 3,422.87
Amanda Medina Romero	$ 6,943.40	$ 531.17	$ 4,500.00	$ 11,974.57
Robert Ortiz	$ 7,150.00	$ 546.97	$ 800.00	$ 8,496.97
Robert Plagge	$ 16,331.30	$ 1,193.39	$ 1,000.00	$ 18,524.69
Terri Stafford	$ 2,956.25	$210.40	$ -	$ 3,166.65
Earl Tarr	$ 4,675.00	$ 294.53	$ 1,200.00	$ 6,169.53
Paul Vance	$ 22,668.80	$ 1,640.96	$ 2,466.00	$ 26,775.76
Manuel Barela	$ 8,000.00	$ 587.96	$ 500.00	$ 9,087.96
Tobias Medina	$ 2,400.00	$ 742.57	$ 500.00	$ 3,642.57
Larry Moore	$3,605	$ 631.61	$ 200.00	$ 4,436.61
Frank Padilla	$1,200	$ 336.63	$ -	$ 1,536.63
Total	$100,330	$ 9,557.02	$ 16,882.00	$ 126,768.77

Class Cost Per Student (e.g., Revenue-Costs/students enrolled)

$185.97

Cost per Graduate (e.g., Revenue-Costs/students graduated this year)

$6695.25

Alumni Surveys

- Vocational Trades needs to create a format for the Alumni surveys
- There is no survey taking place

Program Learning Assessment Plan (Weave)

Appendix B provides the program assessment data and analysis created by faculty.

Student Alumni

- Vocational Trades needs to create a format for the student alumni to help the advisor and the institution stay in contact with alumni
- Examples. Where do they go? If they Transfer or go straight into a job; if a job, list job, if a transfer, list college.

Curriculum Committee Work

- Preliminary work is underway to formally present to the Curriculum Committee for consideration to implement Snap-On certification and to reduce the program's contact hours. Curriculum changes will be submitted to the LCC Curriculum Committee for approval in the Fall 2018 semester.

Final Program Approvals (Board of trustees) approvals to move program forward

N/A

Accreditation

NATEF

Evaluation of the Program

- ASE certified instructors
- Working to implement Snap On certification
- More night course to increase enrollment
- Low enrollment
- Stronger recruitment and working with area high schools to increase student FTEs.
- Be sure program maintains funding so that students will be taught the latest technologies which allow them to be trained as knowledgeable technicians

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Appendix A: **Program Map**

Program Map for CERTIFICATE in Automotive Technology

Term 1 / Fall Semester	Credits	Term 2 / Spring Semester	Credits
AUTO100 Automotive Fundamentals	4	**AUTO108** Manual Transmissions and Drivetrain	4
AUTO104 Electrical and Electronic Systems I	5	**AUTO120** Engine Repair	5
AUTO106 Engine Performance I	5	**AUTO126** Engine Performance II	5
Semester Total	**14**	**Semester Total**	**14**
Milestones		**Milestones**	
Complete Math 075		Complete all Term 2 courses with a letter "C" grade or better	
Meet with Advisor		Complete ENG 098 if needed	
Accumulate 14 or more credits		Meet with Advisor	
Maintain a 2.0 GPA or higher		Accumulate 28 or more Credits	
Complete ENG 078 and/or ENG 098		Maintain a 2.0 GPA or higher	
Enroll in Term 2		Enroll in Term 3	
Term 3 / Fall Semester	**Credits**	**Term 4 / Spring Semester**	**Credits**
AUTO124 Heating and Air Conditioning	4	**AUTO137** Electrical and Electronic Systems II	5
AUTO135 Brakes	4	**AUTO154** Steering and Suspension	4
AUTO128 Automatic Transmissions and Drivetrain	5	**AUTO225** Automotive practicum	3
		APPROVED ELECTIVE	2-4
Semester Total	**13**	**Semester Total**	**14-16**
Milestones		**Milestones**	
Complete all Term 3 courses with a letter "C" grade or better		Complete all Term 4 courses with a letter "C" grade or better	
Meet with Advisor		Meet with Advisor	
Accumulate 41 or more credits		Apply for graduation	
Maintain a 2.0 GPA or Higher		Accumulate 55 or more Credits	
Enroll in Term 4		Maintain an overall 2.0 GPA or higher	
		Graduate with a Certificate	

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Appendix B: Program and Student Assessment of Learning

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Summary

The Automotive Technology Program utilizes various methods to assess student performance. These include but are not limited to quizzes, midterm and final exams, and varied Job Assessment Rubric forms. A course competency plan is included with this packet.

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Automotive Technology Curriculum Profile

2015-2018

Automotive Technology

Certificate

The program prepares students for the automotive industry. It provides students with the skills needed for a job as an entry-level line technician. It covers the automobile in every area such as chassis systems, electrical systems, fuel systems, climate control systems, drive train systems, and engine repair and engine performance. This program also provides upgrades in skills for technicians already working in the automotive industry. Demonstration of appropriate automotive skills to the faculty advisor is required.

The program follows the Automotive Service Excellence (ASE) and National Automotive Technician Education Foundation (NATEF) curriculum standards. Upon completion of this program a student will receive a certificate and may be eligible to take the Automotive Service Excellence (ASE) certification test.

Completion of this certificate can be applied toward the Associate of Applied Science Degree in Vocational/Technical Studies.

Institutional Proficiency Requirements

In addition to the courses listed below for this program of study, students must also complete institutional proficiencies of ENG095, MATH075 and READ095 that are outlined on page 77 of the LCC 2012-2015 Catalog to meet all graduation requirements.

Certificate Requirements - Minimum of 53 Credit Hours

Program Requirements	**(51 hours)**
AUTO100 Automotive Fundamentals	4 credits
AUTO104 Electrical and Electronic Systems I	5 credits
AUTO106 Engine Performance I	5 credits
AUTO108 Manual Transmission and Drivetrain	4 credits
AUTO120 Engine Repair	5 credits
AUTO124 Heating and Air Conditioning	4 credits
AUTO126 Engine Performance II	5 credits
AUTO128 Automatic Transmissions and Drivetrain	5 credits
AUTO135 Brakes	4 credits
AUTO137 Electrical and Electronic Systems II	5 credits
AUTO154 Steering and Suspension	4 credits
AUTO295 Automotive Technology Capstone	1 credits

Approved Electives	**(2 hours)**
AUTO101 General Automotive Service	2 credits
AUTO161 Introduction to Diesel Mechanics	4 credits

CRT100	Introduction to Collision Repair	3 credits
MGMT218	Principles of Small Business Management	4 credits
SMET105	Computer Use for Technology	3 credits
WLDG105	Introduction to Welding	3 credits

AUTO100: Automotive Fundamentals (4 credits)
This course provides the foundation of automotive technology with basic engine theory and operation. Includes lubrication and cooling systems, standards for safety and shop operations, also covers tools and supplies used in the industry. Maintenance procedures and schedules are also covered along with diagnostic concepts. Use of information systems, both printed and computer based, is covered. Industry opportunities and trends are covered along with customer service and professionalism. Practical applications are covered.

Learning Objectives:

- Students will take and pass safety tests, students will learn and comprehend the colors pertaining to OSHA.
- Explain how to properly use equipment in the Automotive shop.
- Identify the different subsystems in the Automobile.
- Identify ASE (Automotive Service Excellence) tests needed to become certified in any of the 8 areas.
- Identify hand tools, and power tools used and how to properly use them.
- Describe how to properly fill out work orders and how to use the different types of diagnostic charts.
- Recognize electrical and electronic circuits in the Automobile
- Identify bolts, and know how to make and repair threads.
- Properly check fluids, know the importance of maintenance, and how to perform an oil change.

Learning Outcomes

- Students will take and pass all safety tests with 100%
- Students will know the components of subsystems of a vehicle
- Students will use hand tools and power tools properly
- A jumper wire will be made by the students, and will know how to use the jumper wire
- Students will be able to identify bolts and know how to make threads in metal for the bolts

AUTO101: General Automotive Service (2 credits)
This course will include the functions and use of automobile components, procedures and methods of preventive maintenance, lubrication, servicing, wheel bearings, tire rotation,

servicing oil, fuel, filters and battery. Practical applications are covered with an emphasis on safety. Corequisite: AUTO100.

Learning Objectives:

- Explain and pass 5 safety tests and do job 1 in workbook.
- Describe how to perform an oil change.
- Perform a leak inspection of fluids on a vehicle.
- Describe how to change, inspect, and or replace hoses and or a thermostat on a vehicle.
- Identify how to inspect and or replace shock absorbers.
- Explain how to rotate and balance tires properly.

Learning Outcomes

- Properly perform an oil change
- Students will properly balance tires
- Students will change shock absorbers and struts
- Will change an alternator and belts
- Will replace radiator hoses and thermostat

AUTO104: Electrical and Electronic Systems I (5 credits)
This course covers basic automotive electricity, electronics fundamentals, theory and applications for automotive circuits. This course will also cover diagnosis and repair of electrical systems and schematic study. Battery, starting and charging systems are specifically studied in this course.Corequisite: AUTO100.

Learning Objectives:

- Will know how to compare voltage, current, and resistance. Will also know how to perform fundamental electrical tests.
- Visually inspect battery, perform basic battery test, safety practices of battery removal, installation, and proper procedure for jumping a battery.
- Describe the safety practices that should be followed when diagnosing, testing, and repairing a starter motor. Adjust a neutral safety switch.
- Inspect, diagnose, remove, and repair charging system components properly and safely.
- Properly inspect, diagnose, and repair ignition system components.

Learning Outcomes

- Students will know how to use a multimeter to perform basic electrical tests
- Will perform a battery inspection and procedures for battery replacement
- Will properly disassemble and reassemble a starter
- Will properly remove and replace an alternator
- Will know how to test electrical components

AUTO106: Engine Performance I (5 credits)
This course will cover engine performance diagnosis and repair of systems related to drive ability, including carburetion, ignition systems, fuel systems and engine mechanicals. The course will also cover diagnostic equipment usage and procedure based strategies. Corequisite: AUTO100.

Learning Objectives:

- Know the safe and proper way of inspecting, testing, and repair of the fuel system components. Know the difference between mechanical and electric fuel pumps and proper and safe procedure for replacing.
- List and explain the different classifications and advantages of fuel injection systems.
- List and explain and identify the basic parts of the carburetor.
- Describe the differences between gasoline and diesel engines.
- Describe basic exhaust system operation and repairs.

Learning Outcomes

- Perform proper testing procedures on fuel systems
- Properly identify electronic fuel pumps and mechanical fuel pumps
- Properly remove and install fuel pumps mechanical and electric
- Properly removal and installation fuel filters
- Diagnose, remove, and install fuel injectors

AUTO108: Manual Transmission and Drivetrain (4 credits)
This course covers theory and operation of the manual transmission along with disassembly and assembly procedures. Clutch operation along with service and repair, differential theory, operation, disassembly and assembly procedures, shafts, along with axles, driveshafts, transaxles and transfer cases will also be covered. Corequisite: AUTO100.

Learning Objectives:

- Identify and describe the parts of a modern drive shaft assembly.
- Explain the basic operation of a transfer case.
- Describe the operation of a differential.
- Explain the basic service and repair of a differential assembly.
- Explain the operation of a manual transaxle assembly.
- Identify the parts of constant velocity drive axles.

Learning Outcomes

- Students will replace u-joints on a drive shaft
- Properly disassemble and re-assemble a manual transmission

- Properly remove and re-install a transfer-case
- Properly remove and install a seal
- Proper removal and installation of constant velocity drive axles

AUTO120: Engine Repair (5 credits)
This course will cover operation and construction of internal combustion engines (ICE). Removal and installation procedures, engine identification, disassembly, inspection, measurement and assembly procedures, along with in-vehicle engine repairs, diagnostic routines and practices. Corequisite: AUTO100.

Learning Objectives:

- Identify and describe the use of common measuring tools.
- Explain the basic function of the major parts of an automotive engine.
- Describe basic automotive engine classifications.
- Explain the construction of a timing gear, timing chain, and timing belt assembly.
- Summarize how to inspect, remove, and disassemble an engine.

Learning Outcomes

- Students will disassemble and reassemble and engine
- Students will be able to identify engine components
- Properly use valve cutting machine and valve seat machine
- Properly identify different camshaft drives
- Proper method for checking the surface of a cylinder head

AUTO124: Heating and Air Conditioning (4 credits)
This course covers principles of heating and air conditioning systems with an emphasis on diagnosis. Identification is covered along with service and repair of both manual and automatic systems. Climate control systems with computer controls are also covered. Corequisite: AUTO100.

Learning Objectives:

- Explain the operation and construction of major cooling system components.
- Check the major parts of a cooling system for proper operation.
- Explain the principles of refrigeration.
- Explain the basic function and construction of each major part of a typical heating and air conditioning system.
- Describe and demonstrate the general procedures for evacuating and charging and air conditioning system.

Learning Outcomes

- Students will be able to identify Heating and Air Conditioning components
- Will be able to identify two common refrigerants used in automobiles
- Will be able to use identifier
- Will be able to use recovery/recycling machine
- Will take and pass ASE(Automotive Service Excellence) test, certification dependant on students submission of test

AUTO126: Engine Performance II (5 credits)
This course will cover basic electricity review, automotive computer systems history, usage, strategy, testing and diagnosis. Emission control systems, fuel injection, distributor less ignition and other performance systems will also be covered. Diagnostics of On-Board Diagnostics (OBD) I and II will have an emphasis on procedure and symptomatic based strategies. Prerequisite: AUTO106.

Learning Objectives:

- Explain input sensor and output device classification and operation.
- Summarize where computers, control modules, sensors, and actuators are typically located.
- Describe the operating principles of emission control systems.
- Explain typical causes of engine performance problems.
- Explain service operations commonly performed during a tune-up.

Learning Outcomes

- Students will perform a compression test
- Properly test sensors
- Properly remove and replace sensors
- Properly perform an engine tune-up
- Will know how to retrieve codes and properly use information obtained

AUTO128: Automatic Transmissions and Drivetrain (5 credits)
This course will cover automatic transmission/transaxle fundamentals including torque converter operations, planetary gear operations, hydraulics principles, valve body operations and transmission power flow. Automatic transmission/transaxle in-vehicle service and repair as well as removal, disassembly, assembly and installation will be covered. Corequisite: AUTO100.

Learning Objectives:

- Identify and describe the function and operation of the major parts of an automatic transmission.
- Make basic external adjustments on an automatic transmission.
- Explain the function of a drive shaft.

- Adjust an automatic transaxle shift linkage.
- Diagnose, remove, and disassemble an automatic transaxle.

Learning Outcomes

- Students will properly diagnose an automatic transmission/transaxle
- Proper removal and re-installation of automatic transmission/transaxle
- Proper procedure for rebuilding transmissions
- Know proper use of tools used for rebuilding transmissions
- Know how to properly make adjustments needed

AUTO135: Brakes (4 credits)
This course provides a foundation to the automotive brake system, including the fundamentals of brake systems. The course includes theory, inspecting and diagnosis practices with an emphasis on safety, along with repair procedures and inspection on specific equipment operation. Corequisite: AUTO100.

Learning Objectives:

- Identify the parts of driving and non-driving hub and wheel bearing assemblies.
- Explain service procedures for wheel bearings.
- Explain and identify the major parts of an automotive brake system.
- Explain how to service a disc and drum brake assembly.
- Identify and explain the major parts of a typical anti-lock brake system.

Learning Outcomes

- Students will know how to measure disc and drums
- Proper method for resurfacing discs and drums
- Will perform brake service on disc brakes on drum brakes
- Will know proper procedure for brake adjustment
- Will know how to properly diagnose brake problems

AUTO137: Electrical and Electronic Systems II (5 credits)
This course will be a review of basic electricity and electronics leading into more advanced lighting systems, instrument panel, horn, windshield wiper/washer and other complex accessories found in the modern automobile. Prerequisite: AUTO104.

Learning Objectives:

- Compare ignition coil, spark plug, and distributor design variations.
- Demonstrate how to replace or repair ignition system parts.
- Explain the operating principles of automotive light, wiper, and horn systems.
- Diagnose basic sound system and power lock systems.

- Summarize the operation of alternate power sources for vehicles.

Learning Outcomes

- Students will be able to identify electrical and electronic components
- Will be able to diagnose and replace electrical and electronic components
- Will be able to make proper electrical repairs
- Will know how to use the soldering gun
- Will know how to use scan tool to diagnose electrical and electronic components

AUTO154: Steering and Suspension (4 credits)
This course will provide a foundation to the automotive chassis system, including the fundamentals of the chassis system. The course includes theory, inspecting and diagnosing practices with an emphasis on safety, along with the repair procedures and specific equipment operation. Alignment procedures will also be covered. Corequisite: AUTO100.

Learning Objectives:

- Identify the parts of a tire and wheel.
- Identify and describe the major parts of a suspension system.
- Diagnose problems relating to a suspension system.
- Compare the differences between a linkage steering and a rack and pinion steering system.
- Describe caster, camber, and toe adjustment.

Learning Outcomes

- Students will know how to properly mount and dismount tires
- Will know how to properly inspect and replace shocks and struts
- Will know how to properly inspect and replace suspension components
- Will know how to inspect and replace a rack and pinion steering
- Will know how to perform an alignment

AUTO161: Introduction to Diesel Mechanics (4 credits)
This course will cover the study of diesel engines, basic systems or diesel engines such as mechanical structure, cooling, lubrications, fuel, storage, troubleshooting, and service are emphasized. Students will also study diagnosis and operating principles of diesel engines by use of diagrams, testing instruments and live engines.

Learning Objectives:

- Discuss shop and personal safety.
- Identify tools used in repair of diesel engines.

- Demonstrate basic diesel engine fundamentals.
- Discuss internal components and function.
- Describe difference from gasoline engines and similarities.
- Show the function of lubrication, fuel, and cooling systems.
- Demonstrate troubleshooting possible problems with diesel engines.
- Discuss the overall function and operation of the diesel engine.
- Show proper procedures in disassembly, reassembly, repair, and identification of diesel components.

AUTO295: Automotive Technology Capstone (1 credits)
This course is for students in their final semester of the Automotive Technology Program. In this course the student will prepare for and take a comprehensive examination. Information/content will come from the core curriculum/program requirements. Study guides, pre-tests and group sessions will be utilized. Students must also submit a portfolio consisting of coursework completed throughout the core program. A sample Automotive Service Excellence (ASE) test will also be taken. Prerequisites: AUTO100, AUTO104, AUTO106, AUTO135, AUTO154 and instructor approval.

Learning Objectives:

- List the most common automotive careers.
- Explain the tasks completed by each type of auto technician.
- Describe the type of skills needed to be an auto technician.
- List the traits employers look for in their employees.
- Explain how to find job openings in the automotive field.

Learning Outcomes

- Will take and pass 8 ASE(Automotive Service Excellence) practice tests
- Will make a resume
- Will perform one job in each section of the ASE areas out of the job sheets book
- Will create a portfolio
- Will practice interview skills

CRT100: Introduction to Collision Repair (3 credits)
This is an introductory course covering the basics of Auto Body Repair including safety orientation, hand tools, power tools, equipment, basic metal straightening, and surface preparation.

Learning Objectives:

- Students will learn Body Shop safety

- Students will learn to repair dents properly using body fillers.
- Students will learn to properly use the tools of the trade.
- Students will learn about metal preparation.
- Students will learn how to properly straighten metal.
- Students will learn about proper sanding techniques.
- Students will learn about the different grits of sand papers, wet or dry, grinding discs, etc.
- Students will learn the basics of a collision, whether to determine if it's direct or indirect damage.

Course Learning Outcomes (Competencies)

- Students will learn to repair minor dents and to perform proper surface preparation
- Master proper usage of the tools of the trade, tool safety, body fillers and plastic repair.
- Understand the proper techniques of sanding and stripping techniques.

MGMT218: Principles of Small Business Management (4 credits)
This course provides students with extensive knowledge of the steps needed to start and run a small business. Topics include; entrepreneurial opportunities, preparing the business plan, marketing and managing small business operations, financial and administrative controls, and social and legal environment.

Course Competencies: Upon successful completion of this course students will be able to:

- Demonstrate the importance of a business plan for small businesses;
- Demonstrate and utilize all elements in a business plan;
- Identify business opportunities in starting, operating, and maintaining a business, and
- Recognize the importance of customer service

SMET105: Computer Use for Technology (3 credits)
This course is the study of the fundamentals of computer technology software used in engineering technology fields. Emphasis will be placed on technical and scientific computer applications. Topics to be covered will include an introduction to computer concepts, Windows, Microsoft Word, Excel, Access, and PowerPoint, and other specific software applications used to interface various engineering technologies fields.

Course Objectives:

- The objective of the course is to provide students with the computer basics for success in the STEM disciplines. Students will become proficient at basic Microsoft programs and will be introduced to AutoCAD software.

Learning Outcomes: upon completion of the course with a grade of "C" (70%) or better, the student will be able to:

- Demonstrate a knowledge of the course content through quizzes, projects, and exams
- Apply the concepts learned in class to unit projects
- Demonstrate a working knowledge of both Microsoft and AutoCAD software

- Demonstrate a working knowledge of hardware and components

WLDG105: Introduction to Welding (3 credits)
This course teaches the fundamentals in the welding processes, shop orientation, and shop safety. Start with oxy/acetylene cutting and welding, and advance into basic MIG,TIG, and stick welding. Plasma cutting will be introduced. Welding will be tested in the flat, horizontal, vertical and overhead positions. Practical applications are covered and pipe welding will be introduced.

Learning Outcomes:
1. Identify some of the common hazards in welding.
2. Explain and identify proper personal protection used in welding.
3. Describe how to avoid welding fumes.
4. Explain some of the causes of welding accidents.
5. Identify and explain uses for material data safety sheets
6. Explain safety techniques for storing and handling bottles.
7. Explain how avoid electrical shock while welding.
8. Identify and explain the use of oxy/fuel cutting equipment.
9. Set up oxy/fuel equipment.
10. Light and adjust an oxy/fuel torch.
11. Proper shut down of bottles.
12. Change cylinders
13. Perform oxy/fuel cutting and welding procedures.

Assessment

Luna Community College defines assessment as a process that will lead to the improvement of student learning. The process must follow four steps as illustrated below.

LCC Assessment Plan

All course offerings, including degree and certificate programs, at Luna Community College are required to follow the four-step assessment process. They include:

1. A list of expected learning outcomes
2. Assessment tools that directly measure those learning outcomes
3. The results of the data, and
4. How the data will be used to improve student learning

Academic Departments as Luna Community College are required to participate in semester "Improving Student Learning" assessment reporting and Student Learning Outcomes Assessment (SLOA) Committee presentations. Every semester, academic departments focus on specific learning outcomes with a targeted student population. Faculty are selected to participate in SLOA; selected faculty participate in developing assessment methods and procedures for their particular course or courses. The faculty give oral presentations at the end of the semester and information gathered is disseminated among SLOA members, faculty and staff. The purpose is to provide a baseline for future improvements.

Visit our web site at www.luna.edu to review LCC's Improving Student Learning (ISL) reports. LCC also abides by the New Mexico state competencies for general education. 22

LUNA COMMUNITY COLLEGE
Standard "Minimal" Requirements for Course Syllabus

Course	course title and other course information including meeting times, dates, room number, credits, semester, prerequisites and/or co-requisites
Faculty	information about the instructor and his or her contact information (e.g., phone number and email). List time and day of office hours for full time faculty
Course Description	use catalog description
Expectations of Students	What do you expect from your students? For example, description of students' responsibilities in the learning process; how you hope the students will approach the course subject/content; take responsibility for their learning; the amount of study time expected in the course, and suggestions on how to succeed in the course.
Course Learning Outcomes (Competencies)	this section will include a list of skills or techniques students will develop from the course. This list will consists of a minimum of four to six quantifiable statements about what students will be able to do after completing the course.
New Mexico CORE Competencies	If teaching a CORE course, the State HED competencies must be stated (e.g., Communications, Mathematics, Laboratory Science, Social & Behavioral Sciences, Humanities & Fine Arts).
Methods of Measuring Learning Outcomes (Competencies)	What tools are used to measure student success based on the learning outcomes?

Evaluation	Indicate how the student will earn a particular grade, such as information about assignments including types of assignments, nature of exams (e.g., take home, open book, in-class) due dates, grading criteria and so forth.
Course Schedule	Add a tentative schedule indicating the course content that will be covered throughout the course (e.g., eight week or sixteen week schedule).
Policies	Include policies such as attendance, academic responsibilities, late assignments, missed exams, cell phones, etc. Add a statement that indicates: for additional student information, refer to the Student Handbook
Grading Standard	Refer to the LCC Catalog
Textbook(s)	Name of required textbooks(s) and any recommended materials. Include ISBN number(s)
Important Dates	List important dates such as last day to withdraw from the course, holidays, add/drop, midterm, final exam week, spring break and other important dates.
ADA Statement	Add a statement regarding accommodations for students with disabilities
Syllabus Revisions or Changes	Add a statement that indicates the syllabus is subject to change
Internet Courses (non-proctored)	Use the following statement: LCC will ensure firm student identification for examinations through the use of username and password for non proctored exams. As an on-line student, you are responsible for keeping your username and password secure. Your username and password should not be given out as you are responsible for

all assessment, assignments, and on-line communications. Any academic dishonesty/plagiarism will not be tolerated and is grounds for disciplinary actions.

Luna Community College
Core Competencies Assessment-2017
Automotive Technologies
In Accordance With ASE and NATEF Requirements
(Automotive Service Excellence) (National Automotive Technicians Education Foundation)

Program Competencies	Assessment Procedures	How Results Will be Used To Make Improvements	Goals/Priorities
Students will be introduced to the basics of automotive technology, including information like automobile construction and operation, ASE certification, safety, tools, service information, electricity, and vehicle maintenance. Knowledge given will secure an entry level job. Students will be shown the different careers available in the automotive industry, they will be instructed on the importance of good communication skills, as well as resume writing skills. Students will create a resume, they will be instructed on how to properly fill out a work order, and how to use information needed by obtaining it by using the computer or books. Students will be able to identify the different components of the different areas of the vehicle. Students will be able to disassemble and reassemble the basic components of the vehicle in the 8 different ASE areas.	Students will perform a pre/post test as well as pre/post evaluations. Students will be assessed using the student tech manual which follows NATEF (National Automotive Technician Education Foundation) standards. Students will Take practice ASE tests in each of the 8 ASE areas, DATO's (Diagnostic Scenarios) and Simulations will also be utilized in each area. Job Sheets will also be utilized after each chapter to comprehend theory as well as getting hands-on experience. Job sheets will be used to gauge the students success.	Find areas in the curriculum that could use improvement. Also identify areas where more visual or practical aids may be utilized.	**By the end of the semester all students will be able to correctly identify various systems and components in/on the automobile, prescribed by the classes taken. Students will know the proper use and safe handling of equipment, safety gear, and tools used in the classes taken in one of the 8 ASE areas.**

FOLD ALONG PERFORATION TO REMOVE CERTIFICATE ASE-1254-4419

National Institute for
AUTOMOTIVE SERVICE EXCELLENCE

Be it known that

EUGENE M SANDOVAL

has successfully passed the examinations and met the work experience requirement prescribed by the National Institute for Automotive Service Excellence and is hereby **ASE CERTIFIED** in the service areas listed below.

MASTER AUTOMOBILE TECHNICIAN

AREAS OF DEMONSTRATED ACHIEVEMENT	EXPIRES
ENGINE REPAIR	DECEMBER 31, 2022
AUTOMATIC TRANSMISSION/TRANSAXLE	DECEMBER 31, 2022
MANUAL DRIVE TRAIN AND AXLES	DECEMBER 31, 2022
SUSPENSION AND STEERING	DECEMBER 31, 2022
BRAKES	DECEMBER 31, 2022
ELECTRICAL/ELECTRONIC SYSTEMS	DECEMBER 31, 2022
HEATING AND AIR CONDITIONING	DECEMBER 31, 2022
ENGINE PERFORMANCE	DECEMBER 31, 2022

GIVEN THIS 27TH DAY OF OCTOBER 2017, AT LEESBURG, VIRGINIA

ASE-1254-4419
ASE IDENTIFICATION NUMBER

Timothy A. Zilke
TIMOTHY A. ZILKE, President

FOLD ALONG PERFORATION TO REMOVE CERTIFICATE ASE-1254-4419

National Institute for
AUTOMOTIVE SERVICE EXCELLENCE

Be it known that

EUGENE M SANDOVAL

has successfully passed the examinations and met the work experience requirement prescribed by the National Institute for Automotive Service Excellence and is hereby **ASE CERTIFIED** in the service areas listed below.

UNDERCAR SPECIALIST

AREAS OF DEMONSTRATED ACHIEVEMENT	EXPIRES
EXHAUST SYSTEMS	JUNE 30, 2020
SUSPENSION AND STEERING	DECEMBER 31, 2022
BRAKES	DECEMBER 31, 2022

GIVEN THIS 27TH DAY OF OCTOBER 2017, AT LEESBURG, VIRGINIA

ASE-1254-4419
ASE IDENTIFICATION NUMBER

Timothy A. Zilke
TIMOTHY A. ZILKE, President

CERTIFIED TECHNICIAN

THIS CERTIFIES THAT

Eugene Sandoval

has completed the prescribed lesson, lecture and assignments for the course listed below and is entitled to this certificate of attendance

JohnBean

Wheel Balancing Basics

2 hours

07/24/2017		Snap-on
Date Completed		School/Certification Center

CERTIFIED TECHNICIAN

THIS CERTIFIES THAT

Eugene Sandoval

has completed the prescribed lesson, lecture and laboratory signments for the course listed below and is entitled to this certificate.

Wheel Alignment Certification

(8 Hours)

07/26/2017
Date Completed

Snap-on
School/Certification Center

Pro 42 Wheel Alignment Certification

Eugene Sandoval has displayed competency of the content listed below through both cognitive and skill based assessments.

I. **Wheel Alignment Safety**
1. Basic Safety Precautions
2. Safety Risk Awareness

II. **Theory of Operation**
1. 3D Vision Aligner Theory
2. Software
3. Cameras
4. Target Acquisition
5. Positioning Sequence
6. 3D Vehicle Modeling

III. **Standard Alignment Procedure**
1. Vehicle Positioning
2. Target Attachment
3. Home Screen Layout & Navigation
4. Using Alignment Wizards
5. Vehicle Selection
6. 4-Wheel Positioning
7. Caster Sweep Procedure
8. Rear Meters & Adjustment
9. Front Meters & Adjustment
10. EZ Toe Operation
11. Final Reports & Printing

IV. **Advanced Measurements**
1. Measurement Menu Overview
2. Vehicle Dimension & Tire Diameter
3. Single Wheel Positioning
4. Ride Height

V. **Advanced Adjustments**
1. Adjustment Menu Overview
2. Elevated Axle Adjustments
3. Wheel Off Adjustments
4. Cradle Adjustments

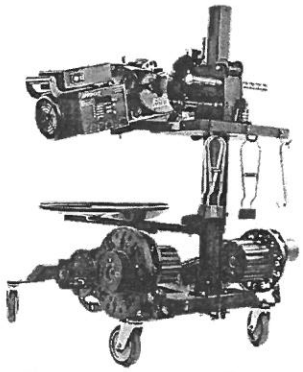
VI. **Maintenance & Troubleshooting**
1. Performing a Backup and Restore
2. Target Identification
3. Ride Height Target Calibration
4. Confirming The Rack is Level

Snap-on
Certification Center

07/26/2017
Date Completed

CERTIFIED TECHNICIAN

THIS CERTIFIES THAT



Eugene Sandoval

has completed the prescribed lesson, lecture and laboratory assignments for the course listed below and is entitled this certificate

Master Rotor Matching Certification 8 hours

07/28/2017
Date Completed

Snap-on
School/Certification Center

Pro-Cut Master Rotor Matching Certification

Eugene Sandoval has displayed competency of the content listed below through both cognitive and skill based assessments.

I. **Brake System History & Evolution**
1. Hubbed vs Hubless Rotors
2. Tighter Tolerances
3. Stacked Tolerances
4. Bench Lathe Comparison
5. Brake Pad Materials

II. **Lateral Runout (LRO)**
1. Brake Function
2. Myth of Warped Rotors
3. LRO and Disc Thickness Variation (DTV)
4. LRO Specifications

III. **Rotor Repair Essentials**
1. Common Specifications & Application
2. Surface Finish Requirements
3. Proper Cleaning: Grease vs Chips
4. OEM Warranty Requirements

IV. **Match Machining**
1. Pro-Cut Safety Requirements
2. Pro-Cut 9.2 DRO Overview
3. Included Adapters & Accessories
4. Vehicle / Hub Preparation
5. Lathe Preparation
6. Pro-Cut Operation

V. **Finishing the Perfect Brake Job**
1. Cleaning
2. Lubrication
3. Final Inspection

VI. **Surface Finish Issues**
1. Elements of a Clean Cut
2. Record Cut Cause & Correction
3. Concentric Rings Cause & Correction
4. Chatter Cause & Correction
5. Star Pattern Cause & Correction

VII. **Lathe Maintenance**
1. General Care and Cleaning
2. Gib Adjustment

VIII. **Special Features & Calibration**
1. Calibration Procedure
2. Efficiency Tracking
3. DRO Diagnostics

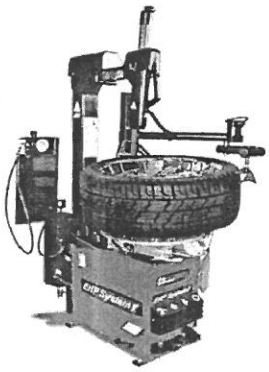
IX. **Optional Equipment**
1. Truck Adapters
2. Dual Rear Wheel Adapters
3. PCBN Cutting Tips
4. G2X Cutting Head
5. GYR System

Snap-on
Certification Center

07/28/2017
Date Completed

CERTIFIED TECHNICIAN

THIS CERTIFIES THAT



Eugene Sandoval

has completed the prescribed lesson, lecture and laboratory assignments for the course listed below and is entitled to this certificate.

Wheel Handling

(4 Hours)

07/25/2017
Date Completed

Snap-on
School/Certification Center

CERTIFIED TECHNICIAN

THIS CERTIFIES THAT

Eugene Sandoval

has completed the prescribed lesson, lecture and assignments for the course listed below and is entitled to this certificate of attendance

JohnBean®

Alignment Fundamentals

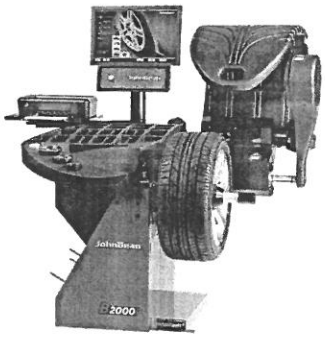
3 hours

07/26/2017
Date Completed

Snap-on
School/Certification Center

CERTIFIED TECHNICIAN

THIS CERTIFIES THAT



Eugene Sandoval

has completed the prescribed lesson, lecture and laboratory assignments for the course listed below and is entitled to this certificate.

Wheel Balancer Certification

(4 Hours)

07/25/2017
Date Completed

Snap-on
School/Certification Center

B2000P Wheel Balancer Certification

Eugene Sandoval has displayed competency of the content listed below through both cognitive and skill based assessments.

I. **Unit 1 Wheel Balancer Safety**
1. Basic Shop Safety Considerations
2. Balancer Specific Safety

II. **Unit 2 B2000P Overview**
1. 3D Imaging Technology
2. Diagnostic Features
3. Laser / Camera Imaging Systems
4. Technical Data
5. Accessories

III. **Unit 3 Controls and Display**
1. Touch Screen Interface
2. Basic Command Keys
3. Main Operating Screens
4. Balancer Settings & Configurations

IV. **Unit 4 Modes of Operation**
1. Wheel Clamping
2. Overview of the 5 Balancing Modes

V. **Unit 5 Manual Mode**
1. Manual Mode Overview
2. Vehicle Type Selection
3. Manual Mode Data Entry
4. Weight Placement Selection
5. Balance Screen Navigation
6. Static & Dynamic Balance Options

VI. **Unit 6 Profiling Mode**
1. Profiling Mode Overview
2. Advanced Spoke Detection
3. Tape Weight Placement
4. Rim Data Freeze Option
5. Hidden Weights

VII. **Unit 7 Balance with Runout Mode**
1. Balance with Runout Overview
2. Balance with Runout Operation
3. Tread Depth Indication (TDI)
4. Wheel Assembly Warnings & Alerts
5. Optima Harmonic Diagnosis
6. Advanced Runout Diagnosis
7. Rim Only Diagnosis
8. Optima Matching
9. Advanced Optima Settings
10. Predictive Tread Wear
11. Weight Usage Tracking

VIII. **Unit 8 Full Diagnostic Mode**
1. Full Diagnostic Mode Overview
2. Full Diagnostic Operation
3. Radial Force Vectoring (RFV) Data
4. Tread Plot
5. Internal Sidewall Plot
6. External Sidewall Plot
7. Tread Condition Report
8. 3D Full Wheel Assembly Plot

IX. **Unit 9 Opti-Line**
1. Opti-Line Overview
2. Minimizing Pull
3. Minimizing Vibrations

X. **Unit 10 Optimization/Minimization**
1. Optimization Procedure
2. Minimization Procedure

XI. **Unit 11 Calibration & Maintenance**
1. Balancer Calibrations
2. Monitor Calibrations
3. Fuse Replacement

Snap-on
Certification Center

07/25/2017
Date Completed