WSU Five-Year Program Review
Self-Study

Department/Program: Automotive Service Technology

Semester Submitted: Spring 2012

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A. Brief Introductory Statement:

Weber State University (WSU) is one of the few select schools in the country whose automotive students are actively recruited by most of the major automobile manufacturers in the world.

Our partnerships with Chrysler, Ford, General Motors, Honda and Toyota help our students to be better prepared for a variety of careers in the automotive industry.

WSU graduates are well known in the automotive industry holding service, technical support, advanced technical, marketing, management, sales, and teaching positions all across the country.

B. Mission Statement

The mission of the Automotive Technology Department Associate of Applied Science Degree in Automotive Service Technology is to prepare graduates to be competent in the technical theory and application of the automobile and become immediately productive as an automotive technician. Individuals will have the opportunity for specific training and certification from various automotive manufacturers and service programs such as:

a. General Motors Corporation
b. Toyota Motor Sales USA
c. American Honda Motors
d. Chrysler Corporation
e. Ford Motor Corporation
f. Collision Repair Industry
g. Independent Shops
h. HD-Truck Industry

Automotive Service Technology graduates will possess national certification, the ability to communicate and solve problems efficiently and will have developed a life long skill.

C. Curriculum

The Course numbers in the table below contain an "x" to represent a different course for each of the AAS degrees we have. For example: 2 = Ford and Independent Shop, 4 = General Motors, 5 = Chrysler, 6 = Toyota, 7 = Heavy-Duty Truck, 8 = Collision Repair.

Curriculum Map – NOTE: Only the courses highlighted in yellow are evaluated this year

Core Courses in Department/Program	Department/Program Learning Outcomes							
	Utilize proper safety equipment and procedures	Locate and utilize relevant electronic service information	Describe theory of operation	Demonstrate the proper use of service tools and equipment	Perform accurate Diagnosis	Perform Repairs properly	Verify Repairs	Present final report and presentation on topics learned
AUSV 1000 Introduction to Automotive Service	I, U, E, A	I, U, E, A		E, U, A				
AUSV 1001 Collision Repair Fundamentals and Estimating	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 1080 Non-Structural Analysis and Damage Repair 1	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 1085 Painting and Refinishing 1	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 10x1 Brakes	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 10x2 Suspension And Steering	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 1180 Structural Analysis and Damage Repair 1	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 11x0 Engine Repair	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 12x0 Manual Drive Train And Axles	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 13x0 And AUSV 21x0 Electrical/Electronic Systems	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 2080 Painting and Refinishing 2	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 2085 Non-Structural Analysis and Damage Repair 2	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 20x0 Engine Performance	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 23x0 Heating And Air Conditioning	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 2480 Auto-Body Business Practices								I, U, E, A
AUSV 25x0 Automatic Transmission And Transaxle	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 2860 Shop Practice	I, U, E, A	E, U, A		E, U, A	E, U, A	E, U, A	E, U, A	
AUSV 2880 Cooperative Practicum	I, U, E, A	E, U, A		E, U, A	E, U, A	E, U, A	E, U, A	

Core Courses in Department/Program	Department/Program Learning Outcomes							
	Utilize proper safety equipment and procedures	Locate and utilize relevant electronic service information	Describe theory of operation	Demonstrate the proper use of service tools and equipment	Perform accurate Diagnosis	Perform Repairs properly	Verify Repairs	Present final report and presentation on topics learned
ATTC 3000 Introduction to Automotive Technology		I, E						I, E, U, A
ATTC 3020 Introduction to Safety Management and Hazardous Materials	I, E	I, E	I, E, A					I, E, U, A
ATTC 3260 Advanced Electrical Systems	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 3280 Advanced Painting and Refinishing	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 3480 Advanced Structural Analysis and Damage Repair	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 3520 Fleet Management								I, E, U, A
ATTC 3620 Automotive Business Practices								I, E, U, A
ATTC 3680 Automotive Damage Analysis and Estimating	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 3760 Advanced Automotive Technologies	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 3880 Cooperative Practicum	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 4380 Advanced Non-Structural Analysis and Damage Repair	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 4560 Advanced Propulsion Systems	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 4720 Capstone Project	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 4760 Alternate Fuel Systems	I, U, E, A	I, U, E, A	I, E, A	E, U, A	E, U, A	E, U, A	E, U, A	
ATTC 4780 Insurance Industry Business Practices								I, E, U, A
ATTC 4860 Automotive Standards, Laws, and Regulations								I, E, U, A
AUSV 2180 Structural Analysis and Damage Repair 2	I, U, E, A			E, U, A	E, U, A	E, U, A	E, U, A	

Note: I = Introduced, E = Emphasized, U = Utilized, A = Assessed Comprehensively

D. Student Learning Outcomes and Assessment*

1. **Utilize Proper Safety Equipment And Procedures** - The Weber State University (WSU) Automotive Department has made student safety a top priority. WSU has made every effort to comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations. Every automotive student is required to complete a shop safety module and two certifications from the Safety and Pollution Prevention (S/P2) website before performing any work in the shops. These requirements insure that our students have been exposed to local, state, and federal safety and environmental regulations.
2. **Locate And Utilize Relevant Electronic Service Information** – The automobile industry no longer uses paper service manuals or other types of service information for diagnostic, repair, and service information. It is critical that our students are computer literate and are able to successfully locate the appropriate service information for the task they need to perform. Out automotive shops are equipped with many computers for this purpose as well as a dedicated computer lab with the ability to print what is needed.
3. **Describe Theory of Operation** - It is critical that our students are familiar with the operational characteristics of the automotive system, component, or assembly they are attempting to repair, adjust, or replace. Having access to electronic service information is required for access to this information, however; the student must be able to read and comprehend the information and utilize it to complete a proper service procedure.
4. **Demonstrate The Proper Use Of Service Tools And Equipment** – There are many specialized pieces of service equipment and special tools required to perform accurate diagnosis, repair, or service of many to the systems of today's automobiles. The WSU Automotive Department has over 13,000 of these specialized tools in its tool inventory. Our students are required to determine the tool(s) required for the service procedure they are performing, locate the tool and properly utilize the tool without damaging the tool or the vehicle.
5. **Perform Accurate Diagnosis** – Almost anyone can repair a problem once someone has accurately diagnosed it. Our students are taught the proper diagnostic strategies and routines required to accurately diagnose malfunctions in automotive systems. There is no easy way to become proficient with proper diagnostic procedures without a lot of practice. Our programs contain many hours of diagnostic practice on all eleven areas of automotive repair. Out students are required to pass a diagnostic exercise as part of most of our class final exams.
6. **Perform Repairs Properly** – Once an automotive malfunction has been diagnosed, it must be repaired. Our students are required to demonstrate proper repair procedures for most of our classes. See Appendix G for the

individual course objectives. There are hundreds of these tasks that each student must perform and be assessed on.

7. **Verify Repairs** – Once a repair has been performed, our students are taught the proper ways to verify that the repair has actually solved the customer concern of a malfunction or service procedure. Many times a student will think they are done with a certain service procedure or repair, but have not verified that it is actually fixed. This verification process is taught and assessed in most of our classes.
8. **Present Final Report And Presentation On Topics Learned** – Some of our classes are lecture based rather than hands-on classes. These classes have requirements of a final student presentation to prove comprehension of the topics presented. These are typically PowerPoint presentations given orally in front of the entire class with a question and answer section at the end.

*See Appendix G for individual course learning outcomes.

Evidence of Learning: Courses within the Major

The courses taught in the automotive department are hands-on performance-based courses. Each student must perform each specific learning outcome (task) to pass the class. Evidence of learning is shown in the worksheets developed to assess each the student's completion and mastery of each task. We have hundreds of worksheets available for review upon request. The rubric used for many worksheet tasks is shown below:

Instructor Evaluation: Using the rating scale, initial the appropriate box to indicate the degree of competency achieved. **Rating Scale:** **No Exposure** = no information or practice provided during the training program, complete training required. **Exposure Only** = general information provided with no practice time, close supervision needed and additional training required. **Moderately Skilled** = has performed independently during the training program, limited additional training may be needed. **Skilled** = can perform independently with no additional training							
No Exposure		**Exposure Only**		**Moderately Skilled**		**Skilled**	

Evidence of Learning: High Impact or Service Learning

The courses taught in the automotive department are high impact learning courses because they are all hands-on performance-based courses. Each student must perform each specific learning outcome (task) to pass the class. Evidence of learning is shown in the worksheets developed to assess each the student's completion and mastery of each task. These worksheets are also intended to help the students make discoveries regarding automotive service and diagnostics and help connect previous learning in prerequisite courses to

learning in the current course. We have hundreds of worksheets available for review upon request.

E. Academic Advising

Advising Strategy and Process

The current academic advising strategy and process for the Automotive Technology department involves the use of every faculty member and some of our staff. Each faculty member is also a program coordinator for a specific program in our department. The following is a list of the coordinators and their programs:

- John Kelly – Automotive Technology Bachelor of Science Degree and Heavy-Duty Truck Program Associate of Applied Science (AAS) Degree
- Scott Hadzik – Chrysler Mopar College Automotive Program (MCAP)
- Justin Tate – Collision Repair AAS Degree
- Joseph Grundvig – General Motors Automotive Service Educational Program (ASEP) AAS Degree
- William Speigle – Ford Maintenance and Light Repair (MLR) program 1-Year Certificate and our Independent Shop Automotive Technical Educational Program (ATEP) AAS Degree
- Kevin Roner – Toyota Technical Education Program (T-TEN) AAS Degree

Each coordinator advises the students in their own programs. Each program has a specific course list and suggested course sequence. The advisor helps students determine the classes they will need to complete the degree as well as help resolve any transfer credits and CatTracks degree evaluation issues.

Our new department secretary and our part time recruiter also help students with some academic advising as well as directing them to the appropriate program coordinator for further advising.

The College also has an advisor for all college programs.

Our department website www.weber.edu/automotive is the primary source of information for academic advising and recruitment. We have a separate web page for each of our six AAS degree programs and our three emphasis options for our BS degree program.

Effectiveness of Advising

Academic advising works pretty well during the regular school year, but there are some limitations and weaknesses.

1. The faculty is not on contract during the summertime and although they are willing to advise students, as needed, the lack of compensation for their time is an ongoing problem.
2. The college recruiter is not as familiar with our programs is would be desirable to advise our students and many times points the students back to our department for assistance.

3. Our new department secretary is not as familiar with our programs is would be desirable to advise our students which results in referring them to our faculty. This puts an increased load on our department faculty.
4. Our part time recruiter is not as familiar with our programs is would be desirable to advise our students resulting in which results in referring them to our faculty. This puts an increased load on our department faculty.
5. Our full-time recruiter resigned his position in August and has not been replaced yet. This has had a negative impact on advising and recruiting. This puts an increased load on our department faculty.

Past Changes and Future Recommendations

The following recommendations would make a positive impact on our advising and recruiting capabilities as well as department personnel job satisfaction and attitudes.

1. Compensate the department personnel during the summertime for academic advising as required.
2. Train the college academic advisor with the proper department advising information.
3. Train our full-time department secretary. Use the secretary during the summertime for academic advising.
4. Train our full-time department recruiter. Use the recruiter during the summertime for academic advising as well as recruiting year round.

F. Faculty

Faculty Demographic Information

The Automotive Department faculty is made up of 8 Caucasian males from the North American geographical area.

Programmatic/Departmental Teaching Standards

All faculty members must adhere to the National Automotive Technicians Educational Foundation (NATEF) curriculum requirements and standards. All faculty members must also adhere to the curriculum and standards requirements set forth by each automotive manufacturer for their specific training programs as well as other partnerships our department maintains. Examples are:

- Chrysler Group LLC: Chrysler Mopar College Automotive Program (MCAP)
- Inter-Industry Conference On Auto Collision Repair (I-CAR)
- General Motors Company: Automotive Service Educational Program (ASEP)
- Ford Motor Company: Maintenance and Light Repair (MLR) program
- Toyota Motor Sales U.S.A.: Toyota Technical Education Program (T-TEN)

- American Honda Motors, U.S.A: Professional Automotive Careers Training (PACT)

Faculty Qualifications

Each Faculty member is brings a unique set of qualifications and experience to the Automotive Department. These qualifications make each faculty member better prepared to teach in a specific automotive program (Chrysler, Honda, General Motors, Ford, and Toyota) as well as our independent Shop program where all makes and models of automotive technology is taught. The following is a list of the qualifications for each faculty member:

Joseph Grundvig

Education:

- 2010 - B.S. Degree in Automotive Technology - Field Service Operations - Weber State University
- 2001 - A.A.S. Degree in Automotive Service Technology - GM ASEP Program - Weber State University.
- Graduate of East High School, Salt Lake City, Utah

Certifications:

- GM World Class Master Technician Certification (2005 - today)
- ASE Master Automobile Technician Certification (expires 12-31-2009)
- ASE L1 (expires 6-30-2012) and B5 Certifications (expires 6-30-2012)
- EPA Clean Air Act - Section 609 Refrigerant Handling Certification

Background:

Eleven years in the automotive industry.

- 2007 - today - Lead Instructor for the GM ASEP program at Weber State University.
- 2004 - 2007- Instructor at the General Motors Training Center at Weber State University.
- 1999 - 2004 - Automobile technician working for General Motors Dealerships

Scott Hadzik

Education:

- Bachelor of Science in Automotive Technology - Weber State University
- Associate of Applied Science – Chrysler CAP - Weber State University

Certifications:

- ASE Master Automobile Technician Certification

- EPA Clean Air Act - Section 609 Refrigerant Handling Certification.
- Chrysler Level 4 Technician Engine Mechanical, Engine Performance, Steering and Suspension, and Electrical

Background:

Three years in the automotive industry.

- 2010 - Present - Lead Instructor in the Chrysler CAP Program at Weber State University.
- Summer 2010 – Intern Quality Assurance Electrical, Toyota Motor Sales, Torrance CA
- 2008 – 2010 – Chrysler Technician, Quality Chrysler Jeep and Dodge, Tooele Utah

Three years USAF Aircraft technician

- Specialized in hydraulic systems for the Boeing KC-135 Stratotanker
- Achieved journeyman skill level 5

Memberships/Affiliations:

- ASE
- Member of Society of Automotive Engineers

Accomplishments:

- Honorable Discharged United States Air Force
- Air Force Achievement Medal with cluster

John Kelly

Education**:**

- 1998 - Master of Education in Curriculum and Instruction - Weber State University
- 1993 - Bachelor of Science in Electronic Engineering Technology - Weber State University
- 1991 - Associate of Applied Science in Automotive Service - GM ASEP - Weber State University.
- 1990 - Associate of Applied Science in Electronic Technology - Weber State University.
- 1980 - Graduate of Box Elder High School - Brigham City, Utah. Howard Gittens, Auto Shop Teacher.

Certifications**:**

- ASE Master Automobile Technician Certification (1988 - today). (expires 12-31-2013)
- ASE A9 Light Vehicle Diesel Certification (2009 - today). (expires 06-30-2014)

- ASE L1 Advanced Engine Performance Specialist Certification (1994 - today). (expires 06-30-2014)
- ASE L2 Electronic Diesel Engine Diagnosis Specialist (2009 - today). (expires 12-30-2014)
- ASE F1 Light Vehicle Compressed Natural Gas Certification (2010 - today) (expires 06-30-2015)
- General Motors World Class Master Technician Certification. (2002 - today)
- Toyota Certified Master Level Technician. (5-1-2009 - today)
- Chrysler Level 4 certifications in Automatic Transmissions, Brakes, and Climate Control Systems.
- Honda Master Technician Certification and Natural Gas Vehicles Certification.
- EPA Clean Air Act - Section 609 Refrigerant Handling Certification (1991 - Today).
- Hybrid-Electric Vehicle Training Certifications from Chrysler, Ford, General Motors, Honda, and Toyota.

Background**:**

Thirty-two years in the Automotive Industry.

- 2010 - 2011 - Program Manager of the Automotive Technology Department at Weber State University.
- 2009 - Today - Associate Professor in the Automotive Technology Department at Weber State University.
- 2006 - 2010 - Chairman of the Automotive Technology Department at Weber State University.
- 2005 - 2006 - Manager of the Automotive Technology Program at Weber State University.
- 2004 - 2009 - Assistant Professor in the Automotive Technology Program at Weber State University.
- 1991 - 2004 - Thirteen years as an instructor at the General Motors Training Center at Weber State University.
- 1989 - 1991 - Adjunct Instructor for the Automotive Program at Weber State University
- 1979 - 1991 - Twelve years as an automobile technician working for independent repair shops (George's Goodyear Tires and Parson's Texaco) and various General Motors Dealerships (Hansen Motor Company, Freeway Oldsmobile-Cadillac, and John Watson Chevrolet in Utah; Hagen Chevrolet in San Diego California).

Memberships/Affiliations:

- Member of Society of Automotive Engineers (SAE International) 2002 - Today
- Member of the Weber State University Faculty Senate. 2007 - Today

- Member of the Weber State University Academic Resources and Computing Committee (ARCC) 2007-2008
- Advisory Committee member of the Job Corps automotive program - Clearfield, UT. 2007 - today
- Member of, and Certified Test Proctor for, the Automatic Transmission Rebuilders Association (ATRA).
- Member of, and Certified Test Proctor for, the Mobile Air Conditioning Society (MACS).

Accomplishments**:**

- 2011 - Overhauled and updated the Weber State University Automotive Technology department website www.weber.edu/automotive
- 2010 - Created the WSU Automotive Transmission Lab. Teaching specialty classes in automatic transmissions and manual drivetrain. Visit www.youtube.com/weberauto for more information and demonstrations.
- 2010 - Completely renovated and repainted most of the automotive shops at Weber State University.
- 2008-2009 - Curriculum designer and developer of several new advanced vehicle technologies classes including: Advanced Electrical Systems, Advanced Automotive Technologies, Advanced Propulsion Systems, and Alternate Fuel Systems, Automotive Standards, Laws, and Regulations.
- 2008 - 25+ Years Certification Award from the National Institute for Automotive Service Excellence (ASE).
- Member of the International Association - General Motors Automotive Service Educational Program (IAGMASEP) curriculum committee. 2006 - 2008
- 2007 - Today - Owner of two Hybrid-Electric Vehicles for hybrid-electric research.
- 2007 - Vibration Software used in an article published by Babcock Publishing's "Brake and Front-End Magazine" January 2007.
- 2007-2008 - Supervised the revision of the entire Automotive Technology Bachelor of Science Degree program at Weber State University; three new degree options were added. Eleven new classes were added, four classes were revised. Designed and wrote a large part of the new and revised curriculum including online courses where applicable.
- 2005-2006 - Supervised the revision of the all seven Associate of Automotive Service Technology Applied Science Degree programs at Weber State University. Dedicated classes, instructors, materials, and vehicles were created for each of the seven degrees. Designed and wrote portions of the new curriculum.
- Created and maintain the Automotive Technology department website www.weber.edu/automotive
- 2005 - Vibration Software used in an article published by ATRA Publishing's "Gears Magazine" December 2005.

- 2003 - Authored Book: Specialized Automotive Electronics Training - Weber State University Printing
- 2002 - today Wrote, designed, and teach four online courses for Weber State University in Automotive Electronics and Advanced Automotive Technologies.
- 1998 - Today - Designed, marketed, sold, and supported customized automobile and truck vibration diagnosis software. The latest version of the software is currently used worldwide by General Motors Corporation, Ford Motor Company, Freightliner Truck LLC., and Mazda USA in their training Centers for vibration diagnosis training. The use of the software is also called for in their service manuals and is used by their dealership technicians for vibration diagnosis. The software is sold worldwide by SPX Corporation, Kent-Moore Tools of Warren Michigan, Rotunda Tools of Dearborn Michigan, and by my company's website www.vibratesoftware.com.
- 1997-2004 - Participated as a Subject Matter Expert in the curriculum development for the following General Motors Corporate training courses: Automatic Transmission Diagnosis, Base Brake Systems, and Vibration Correction.
- 1991 - 2004 - Hired as an instructor at the General Motors Training Center at Weber State University.
- 1988 - Chevrolet Master Technician - Hansen Motor Company, Brigham City, UT
- 1988 - Oldsmobile Master Technician - Hansen Motor Company, Brigham City, UT
- 1985 - 1987 - Certified Chevrolet Technician - Hagen Chevrolet, San Diego, CA
- 1975 - Eagle Scout, Troop 100, Brigham City, UT
- Currently writing a book on automobile and truck vibration diagnosis.

Kevin Roner
Education:

- 2009 - Bachelor of Science in Automotive Technology – Weber State University
- 2000 - Associate of Applied Science in Automotive Service (Toyota T-TEN Program) - Weber State University.
- 1998 - Vale High School, Vale, Oregon.

Certifications:

- Toyota Master Diagnostic Technician (MDT) (2006 - Today)
- Toyota Master Technician (2004)
- ASE Master Automobile Technician Certification. (2003 - Today) (expires 12-31-2013)
- ASE L1 Certification. (2002 - Today) (expires 06-30-2012)

- EPA Clean Air Act - Section 609 Refrigerant Handling Certification.

Background:

Thirteen years in the automotive industry.

- 2007 - Today - Lead Instructor for the Toyota T-TEN program at Weber State University
- 1998 - 2006 - Eight years as an automobile technician working for Stevinson Toyota West, Inc. , Golden, CO.

Accomplishments:

- 1998 Ford / AAA National Automotive Skills Contest - National Champion.
- 1998 Ford / AAA Oregon State Automotive Skills Contest - State Champion.

William Speigle

Education:

- 2003 - Bachelor of Science in Automotive Technology - Weber State University
- 2001 - Associate of Applied Science - GM ASEP - Weber State University

Certifications:

- ASE Master Automobile Technician Certification (Expires 2016)
- ASE A9 Light Vehicle Diesel Certification (expires 06-30-2014)
- ASE L1 Certification
- EPA Clean Air Act - Section 609 Refrigerant Handling Certification.
- Ford Chassis Master

Background:

Twelve years in the automotive industry.

- 2008 - Present - Lead Instructor in the Independent Shop / Ford MLR Program at Weber State University.
- 2006 - 2008 - Ford Training Specialist, General Physics Corporation, Troy, MI.
- 2004 - 2006 - Ford Service Engineer, TAC Automotive, Allen Park, MI.
- 2002 - 2003 - Technician, Audreys Auto Service, Ogden, UT.
- 1999 - 2001 - Technician, Petersen Motors Co, Riverdale, UT.

Memberships/Affiliations:

- ASE

Accomplishments:

- ASE tests A1 through A8, re-certified Master Technician.
- ASE L1 Advanced Engine Performance.
- Developed training materials, provided classroom electrical training as

well as on the job training for launch of 2008 Town Car at St. Thomas Assembly Plant in St. Thomas, Ontario.
- Developed and delivered repair training for the 2008 Focus at Wayne Stamping and Assembly Plant in Wayne, Michigan.
- Developed and provided training for 6F50 and 6F35 transmissions at the Van Dyke transmission plant in Sterling Heights, Michigan.
- Developed Updated Data Entry system for Launch of 2009 F150 at Dearborn Truck Plant in Dearborn, Michigan.
- Provided on-the-job electrical repair training for the Econoline at Avon Lake Assembly in Avon Lake, Ohio.
- Supported 2007 Expedition/Navigator launch, developed job aids, and updated Quality Leadership System (QLS) data entry system at Michigan Truck Plant in Wayne, Michigan.
- Provided training for 6T70 transmission for General Motors at the Warren Transmission Plant in Warren, MI.
    - On launch team for Ford 6F50 and 6F35 Transmissions at Van Dyke transmission Plant, Sterling heights, Michigan. Extensive knowledge of all Ford electrical systems.

Justin Tate

- ASE Master Collision Repair / Refinishing Technician Certification.

Evidence of Effective Instruction

Our mission statement specifies that we are to prepare graduates to be competent in the technical theory and application of the automobile and become immediately productive as an automotive technician. This means that we will help them to be successful employees. Both regular faculty and adjunct faculty have the same mission and goals.

Mentoring Activities

Mentoring activities occur on an as needed basis. Newer faculty members or faculty members who need to teach an area of automotive technology in which they are not fully trained are cross-trained with a more experienced faculty member. Other mentoring activities include attending the factory training centers of the automotive manufacturers for which we have partnerships (Chrysler, Honda, General Motors, Ford, and Toyota).

Diversity of Faculty

The Automotive Department faculty is made up of 8 Caucasian males from the North American geographical area.

Ongoing Review and Professional Development

Each faculty member is required to attend at least 20 hours of update training per year. In reality, most faculty members attend over 100 hours of update training per year. Our programs are reviewed every 2.5 years by NATEF and

also reviewed annually by each automotive manufacturer we have partnerships with.

G. Support Staff, Administration, Facilities, Equipment, and Library

Adequacy of Staff
Adequacy of Staff is sufficient at this time.

i. Ongoing Staff Development
We ongoing staff development available through Training Tracker and also through various industry partnerships like Toyota, Chrysler, Ford, and General Motors.

Adequacy of Administrative Support
Adequacy of Administrative support has been sufficient. Our previous dean and our new Dean are supportive of our department goals, partnerships, and programs. Our department chairman is also supportive and helpful.

Adequacy of Facilities and Equipment
The facilities and equipment have undergone substantial improvements over the last five years. Aging and worn equipment will still need to be repaired or replaced over time. We have built in some money to accomplish this with student fees.

Adequacy of Library Resources
The library resources are adequate for our department needs. The librarian sends us monthly updates of automotive related resources in the library and offers to obtain anything else we need in the library.

H. Relationships with External Communities

Description of Role in External Communities
We have educational partnerships with Chrysler, Honda, General Motors, Ford, and Toyota to provide service technicians for their dealerships. We also have educational partnerships with auto body and paint suppliers as well as the Automotive Aftermarket Industry Association (AAIA) to provide service technicians for Collision Repair shops and Independent shops. These partnerships open up internship and employment opportunities for our students.

We also have a partnership with the Davis Applied Technology Center (DATC) to allow their Heavy-Duty Truck students to transfer to WSU to complete their AAS degree. This partnership gives us access to Mack and Volvo Heavy Duty Truck training, service information, vehicles, and training components. This partnership opens up additional internship and employment opportunities for our students.

These partnerships provide the automotive department with vehicles, vehicle parts, supplies, curriculum, and training. As a result of these partnerships we have close to 70 new or newer vehicles that we use for up-to-date automotive training. No other school in Utah has this level of partnerships with automotive manufacturers to provide training.

Summary of External Advisory Committee Minutes

We have separate external advisory committees for each of the automotive partnerships we have in the Automotive Department. The advisory committees are comprised of business owners, service managers, shop foremen, current students, program graduates, High School district Career and Technical Education representatives, and manufacturer representatives.

The committees meet twice per year and visit the school once per year to tour the facility and make suggestions for improvement. The committees also help make decisions regarding major purchases; scholarships, hiring interns and full-time employees, common pay for new hires, and curriculum changes. The committee also reports on industry changes or trends they are experiencing that would be relevant to the curriculum we deliver.

The current economic conditions have made it more difficult for all of our students to find employment, as most employers are reluctant to hire hourly workers.

I. Results of Previous Program Reviews

Problem Identified	Action Taken	Progress
Issue 1: Increase legislative funding for the programs	None – The economic conditions have resulted in budget cuts.	None
Issue 2: Create a separate department for these programs	Previous 5 Year Program Review:	A separate Automotive Department was created in 2006.
Issue 3: Implement a clearly defined learning outcomes assessment plan	Previous 5 Year Program Review:	Developed an entrance exam similar to ASE exams and had students take all 8 automotive ASE exams to check for evidence of learning. See attached spreadsheets
	Year 1 Action Taken:	Developed an entrance exam similar to ASE exams and had students take all 8 automotive ASE exams to check for evidence of learning. See attached spreadsheets
	Year 2 Action Taken:	Developed an entrance exam similar to ASE exams and had students take all 8 automotive ASE exams to check for evidence of learning. See attached spreadsheets
	Year 3 Action Taken:	Developed an entrance exam similar to ASE exams and had students take all 8 automotive ASE exams to check for evidence of learning. See attached spreadsheets
	Year 4 Action taken:	Developed an entrance exam similar to ASE exams and had students take all 8 automotive ASE exams to check for evidence of learning. See attached spreadsheets

Summary Information (as needed): Some Entrance exam results were lost because of the Blackboard to Canvas online switch and one faculty member who retired.

J. Action Plan for Ongoing Assessment Based on Current Self Study Findings

Action Plan for Evidence of Learning Related Findings

Problem Identified	Action to Be Taken
Issue 1 Use same exam for entry and exit evaluations	Current 5 Year Program Review:
	Year 1 Action to Be Taken: Determine best exam to use for entry and exit
	Year 2 Action to Be Taken: implement and evaluate exam used
	Year 3 Action to Be Taken: implement and evaluate exam used
	Year 4 Action to Be Taken: implement and evaluate exam used
Issue 2 Use a more consistent rating system for all courses	Current 5 Year Program Review:
	Year 1 Action to Be Taken: Determine best rating scale to use
	Year 2 Action to Be Taken: implement and evaluate rating scale
	Year 3 Action to Be Taken: implement and evaluate rating scale
	Year 4 Action to Be Taken: implement and evaluate rating scale

Summary Information (as needed)

Action Plan for Staff, Administration, or Budgetary Findings

Problem Identified	Action to Be Taken
Issue 1 – There is no clear-cut budget except student fees for each course and program. Additional money is available at times, but is not steady or predictable.	Current 5 Year Program Review:
	Year 1 Action to Be Taken: Make account budget information available to all department members. Decide on major purchases as a group.
	Year 2 Action to Be Taken: Continue same process and evaluate changes needed
	Year 3 Action to Be Taken: Continue same process and evaluate changes needed
	Year 4 Action to Be Taken: Continue same process and evaluate changes needed
Issue 2 – Train our new secretary and recruiter with the information and skills needed to perform their jobs effectively and efficiently.	Current 5 Year Program Review:
	Year 1 Action to Be Taken: Identify training needed and begin training
	Year 2 Action to Be Taken: Continue training and evaluate new needs
	Year 3 Action to Be Taken: Continue training and evaluate new needs
	Year 4 Action to Be Taken: Continue training and evaluate new needs

Summary Information (as needed)

K. Summary of Artifact Collection Procedure – Typical for most Automotive Service Technology courses

Artifact	Learning Outcome Measured	When/How Collected?	Where Stored?
Shop Safety Exercise	Students will demonstrate proper use of safety equipment and procedures.	Start of semester / Class	Paper format
Safety and Pollution Prevention web-based training	Students will demonstrate proper use of safety equipment and procedures.	Start of semester / Class	Electronic format on website
NATEF Task worksheets – See appendix G for NATEF task lists	1. Students will demonstrate their ability to locate and utilize relevant electronic information. 2. Students will demonstrate proper use of service tools and equipment.	During the class lab work	Paper format
Final Exam - Written	1. Students will demonstrate their ability to locate and utilize relevant electronic information. 2. Students will describe theory of operation	End of Semester	Paper or electronic format
Final Exam – Hands-on	3. Students will demonstrate proper use of service tools and equipment. 4. Students will perform accurate diagnosis 5. Students will perform repairs properly 6. Students will verify repairs	End of Semester	Paper format

Summary Information: See the following pages for a breakdown of each of the courses being evaluated this year

Evidence of Learning: Courses within the Major

AUSV 1000

Evidence of Learning: Courses within the Major					
Measurable Learning Outcome Students will…	Method of Measurement Direct and Indirect Measures* See the AUSV 1000 Folder.	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Students will demonstrate proper use of safety equipment and procedures.	WSU Shop Safety Exercise.	Must locate and identify the tag number of all shop safety related items listed with 100% accuracy.	Each student was able to locate all shop safety related tags.	Each student was in front of each safety related item and should be able to find it again if necessary	Each student will know where each shop safety related item is located in the shop in the event of an emergency. Some tags need replacing.
	Each student must complete and pass a web-based safety and pollution prevention course.	The student must pass the class with a minimum score of 80% to be able to print the certificate of completion.	Each student was able to pass the course	Each student should know the federal and state laws related to pollution prevention as outlined in the web-based training.	Each student should know the proper way to dispose of automotive related hazardous materials and utilize that knowledge during the coursework.
Students will demonstrate their ability to locate and utilize relevant electronic information.	Each student must be able to locate the proper service information to perform basic automotive tasks	Each student must be able to identify the vehicle, properly lift the vehicle on a hoist, and perform basic automotive tasks with 100 % accuracy.	Each student was able to perform the required basic automotive tasks in class on a specific vehicle.	Given access to the proper service information, each student should be able to perform the same basic tasks on any other vehicle.	Determine which vehicles are more difficult to perform the basic tasks on and spend more time on those vehicles
Students will demonstrate proper use of service tools and equipment.	Each student must demonstrate proper use of basic hand tools while performing the basic tasks,	Each student must be able to properly use service tools and equipment with 100% accuracy.	Most students were able to demonstrate proper use of tools and equipment.	If a student cannot do these basic tasks, they are in the wrong career field.	Offer additional help or advise students who could not perform this task regarding other career fields.

*At least one measure per objective must be a direct measure.

AUSV 1080 and AUSV 2085 – Non-Structural Analysis and Damage Repair (Parts 1 and 2)

Evidence of Learning: Courses within the Major					
Measurable Learning Outcome Students will…	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Students will demonstrate proper use of safety equipment and procedures.	Each student must complete and pass a web-based collision repair hazardous materials course.	The student must pass the class with a minimum score of 80% to be able to print the certificate of completion.	Each student was able to pass the course	Each student should know the federal and state laws related to pollution prevention as outlined in the web-based training.	Each student should know the proper way to dispose of collision related hazardous materials and utilize that knowledge during the coursework.
Students will demonstrate their ability to locate and utilize relevant electronic information.	Each student must be able to locate the proper service information to perform basic automotive tasks	Each student must be able to identify the vehicle, perform basic collision repair tasks with 100 % accuracy.	Each student was able to perform the required basic automotive tasks in class on a specific vehicle.	Given access to the proper service information, each student should be able to perform the same basic tasks on any other vehicle.	Determine which vehicles are more difficult to perform the basic tasks on and spend more time on those vehicles
Students will describe theory of operation	Each student must be able to describe the theory of operation related to basic automotive service systems and procedures	Each student must be able to describe the theory of operation related to basic automotive service systems and procedures with 80% accuracy	Most students were able to describe the theory of operation related basic automotive service systems and procedures	Some students were absent, others were in attendance but not paying attention.	Some students need additional help while other students need to improve their attendance, study skills, and get more sleep.
Students will demonstrate proper use of service tools and equipment.	Each student must demonstrate proper use of basic hand tools while performing the basic tasks,	Each student must be able to properly use service tools and equipment with 100% accuracy.	Most students were able to demonstrate proper use of tools and equipment.	If a student cannot do these basic tasks, they are in the wrong career field.	Offer additional help or advise students who could not perform this task regarding other career fields.
Students will perform accurate diagnosis	Each student must demonstrate accurate diagnosis of collision related components	Each student must demonstrate accurate diagnosis of collision related components	Most students were able to demonstrate accurate diagnosis of collision related	If a student cannot demonstrate accurate diagnosis of collision related components	Offer additional help or advise students who could not perform this task regarding other

Evidence of Learning: Courses within the Major					
Measurable Learning Outcome Students will…	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
	and systems.	and systems with 100% accuracy.	components and systems	and systems, additional help may be needed	career fields.
Students will perform repairs properly	Each student must demonstrate accurate repair of collision related components and systems.	Each student must demonstrate accurate repair of collision related components and systems with 100% accuracy.	Most students were able to demonstrate accurate repair of collision related components and systems	If a student cannot demonstrate accurate repair of collision related components and systems, additional help may be needed	Offer additional help or advise students who could not perform this task regarding other career fields.
Students will verify repairs	Each student must demonstrate accurate verification of collision related components and systems.	Each student must demonstrate accurate verification of collision related components and systems with 100% accuracy.	Most students were able to demonstrate accurate verification of collision related components and systems	If a student cannot demonstrate accurate verification of collision related components and systems, additional help may be needed	Offer additional help or advise students who could not perform this task regarding other career fields.

*At least one measure per objective must be a direct measure.

AUSV 2060 – Toyota Engine Performance Diagnosis

Evidence of Learning: Courses within the Major					
Measurable Learning Outcome Students will…	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Students will demonstrate proper use of safety equipment and procedures.	Each student must complete and pass a web-based safety and pollution prevention materials course.	The student must pass the class with a minimum score of 80% to be able to print the certificate of completion.	Each student was able to pass the course	Each student should know the federal and state laws related to pollution prevention as outlined in the web-based training.	Each student should know the proper way to dispose of automotive related hazardous materials and utilize that knowledge during the coursework.
Students will demonstrate their ability to locate and utilize relevant electronic information.	Each student must be able to locate the proper service information to perform basic automotive tasks	Each student must be able to identify the vehicle, perform basic automotive repair tasks with 100 % accuracy.	Each student was able to perform the required basic automotive tasks in class on a specific vehicle.	Given access to the proper service information, each student should be able to perform the same basic tasks on any other vehicle.	Determine which vehicles are more difficult to perform the basic tasks on and spend more time on those vehicles
Students will describe theory of operation	Each student must be able to describe the theory of operation related to basic automotive service systems and procedures	Each student must be able to describe the theory of operation related to basic automotive service systems and procedures with 80% accuracy	Most students were able to describe the theory of operation related basic automotive service systems and procedures	Some students were absent; others were in attendance but not paying attention.	Some students need additional help while other students need to improve their attendance, study skills, and get more sleep.
Students will demonstrate proper use of service tools and equipment.	Each student must demonstrate proper use of basic hand tools while performing the basic tasks,	Each student must be able to properly use service tools and equipment with 100% accuracy.	Most students were able to demonstrate proper use of tools and equipment.	If a student cannot do these basic tasks, they are in the wrong career field.	Offer additional help or advise students who could not perform this task regarding other career fields.
Students will perform accurate diagnosis	Each student must demonstrate accurate diagnosis of	Each student must demonstrate accurate diagnosis of	Most students were able to demonstrate accurate diagnosis of	If a student cannot demonstrate accurate diagnosis of	Offer additional help or advise students who could not perform this

Evidence of Learning: Courses within the Major					
Measurable Learning Outcome Students will…	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
	automotive related components and systems.	automotive related components and systems with 100% accuracy.	automotive related components and systems	automotive related components and systems, additional help may be needed	task regarding other career fields.
Students will perform repairs properly	Each student must demonstrate accurate repair of automotive related components and systems.	Each student must demonstrate accurate repair of automotive related components and systems with 100% accuracy.	Most students were able to demonstrate accurate repair of automotive related components and systems	If a student cannot demonstrate accurate repair of automotive related components and systems, additional help may be needed	Offer additional help or advise students who could not perform this task regarding other career fields.
Students will verify repairs	Each student must demonstrate accurate verification of automotive related components and systems.	Each student must demonstrate accurate verification of automotive related components and systems with 100% accuracy.	Most students were able to demonstrate accurate verification of automotive related components and systems	If a student cannot demonstrate accurate verification of automotive related components and systems, additional help may be needed	Offer additional help or advise students who could not perform this task regarding other career fields.

*At least one measure per objective must be a direct measure.

AUSV 2520 – Automatic Transmissions

Evidence of Learning: Courses within the Major					
Measurable Learning Outcome Students will…	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Students will demonstrate proper use of safety equipment and procedures.	Each student must complete and pass a web-based safety and pollution prevention materials course.	The student must pass the class with a minimum score of 80% to be able to print the certificate of completion.	Each student was able to pass the course	Each student should know the federal and state laws related to pollution prevention as outlined in the web-based training.	Each student should know the proper way to dispose of automotive related hazardous materials and utilize that knowledge during the coursework.
Students will demonstrate their ability to locate and utilize relevant electronic information.	Each student must be able to locate the proper service information to perform basic automotive tasks	Each student must be able to identify the vehicle, perform basic automotive repair tasks with 100 % accuracy.	Each student was able to perform the required basic automotive tasks in class on a specific vehicle.	Given access to the proper service information, each student should be able to perform the same basic tasks on any other vehicle.	Determine which vehicles are more difficult to perform the basic tasks on and spend more time on those vehicles
Students will describe theory of operation	Each student must be able to describe the theory of operation related to basic automotive service systems and procedures	Each student must be able to describe the theory of operation related to basic automotive service systems and procedures with 80% accuracy	Most students were able to describe the theory of operation related basic automotive service systems and procedures	Some students were absent; others were in attendance but not paying attention.	Some students need additional help while other students need to improve their attendance, study skills, and get more sleep.
Students will demonstrate proper use of service tools and equipment.	Each student must demonstrate proper use of basic hand tools while performing the basic tasks,	Each student must be able to properly use service tools and equipment with 100% accuracy.	Most students were able to demonstrate proper use of tools and equipment.	If a student cannot do these basic tasks, they are in the wrong career field.	Offer additional help or advise students who could not perform this task regarding other career fields.
Students will perform accurate diagnosis	Each student must demonstrate accurate diagnosis of automotive related	Each student must demonstrate accurate diagnosis of automotive related	Most students were able to demonstrate accurate diagnosis of automotive related	If a student cannot demonstrate accurate diagnosis of automotive related	Offer additional help or advise students who could not perform this task regarding other

Evidence of Learning: Courses within the Major					
Measurable Learning Outcome Students will…	Method of Measurement Direct and Indirect Measures*	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
	components and systems.	components and systems with 100% accuracy.	components and systems	components and systems, additional help may be needed	career fields.
Students will perform repairs properly	Each student must demonstrate accurate repair of automotive related components and systems.	Each student must demonstrate accurate repair of automotive related components and systems with 100% accuracy.	Most students were able to demonstrate accurate repair of automotive related components and systems	If a student cannot demonstrate accurate repair of automotive related components and systems, additional help may be needed	Offer additional help or advise students who could not perform this task regarding other career fields.
Students will verify repairs	Each student must demonstrate accurate verification of automotive related components and systems.	Each student must demonstrate accurate verification of automotive related components and systems with 100% accuracy.	Most students were able to demonstrate accurate verification of automotive related components and systems	If a student cannot demonstrate accurate verification of automotive related components and systems, additional help may be needed	Offer additional help or advise students who could not perform this task regarding other career fields.

*At least one measure per objective must be a direct measure.

APPENDICES

Appendix A: Student and Faculty Statistical Summary

	2006-07	2007-08	2008-09	2009-10	2010-11
Student Credit Hours Total	3234	3565	3377	3288	2957
Student FTE Total	108	119	113	110	99
Student Majors	175	206	243	231	223
Program Graduates					
AAS	17	29	25	36	18
BS	18	23	12	18	19
Student Demographic Profile	175	206	233	231	223
Female	7	8	11	9	9
Male	168	198	222	222	214
Faculty FTE Total	9.58	9.73	9.37	9.32	NA
Adjunct FTE	1.11	1.26	1.81	1.71	NA
Contract FTE	8.47	8.47	7.56	7.61	NA
Student/Faculty Ratio	11.25	12.21	12.01	11.76	NA

Note: Data provided by Institutional Research

Summary Information (as needed)

Appendix B: Contract/Adjunct Faculty Profile (Not including tenured faculty)

Name	Gender	Ethnicity	Rank	Tenure Status	Highest Degree	Years of Teaching	Areas of Expertise
Scott Hadzik	Male	Caucasian	Instructor	Non-Tenure	B.S.	2	Chrysler
Joseph Grundvig	Male	Caucasian	Instructor	Non-Tenure	B.S.	7	General Motors
Kevin Roner	Male	Caucasian	Instructor	Non-Tenure	B.S.	6	Toyota
William Speigle	Male	Caucasian	Instructor	Non-Tenure	B.S.	6	Ford
Justin Tate	Male	Caucasian	Instructor	Non-Tenure	B.S.	6	Collision Repair

Note: Data provided by Institutional Research

Summary Information (as needed)

Appendix C: Staff Profile

Name	Gender	Ethnicity	Job Title	Years of Employment	Areas of Expertise
Jessica Lott	Female	Caucasian	Secretary	1	Office
Mindi Vandersteen	Female	Caucasion	Recruiter		Student recruiting

Note: Data provided by Institutional Research

Summary Information (as needed)

Appendix D: Financial Analysis Summary
Note: Data provided by Provost's Office

Department of Automotive Technology					
Cost	**06-07**	**07-08**	**08-09**	**09-10**	**10-11**
Direct Instructional Expenditures	1,348,313	1,234,751	1,123,264	994,699	943,650
Cost Per Student FTE	12,508	10,391	9,979	9,076	9,574
Funding	**06-07**	**07-08**	**08-09**	**09-10**	**10-11**
Appropriated Fund	1,037,057	936,374	970,715	860,689	793,089
Other:					
Special Legislative Appropriation					
Grants of Contracts	286,571	286,765	122,776	111,952	100,754
Special Fees/Differential Tuition	24,686	11,612	29,773	22,058	49,807
Total	1,348,313	1,234,751	1,123,264	994,699	943,650

Appendix E: External Community Involvement Names and Organizations

Name	Organization
Service Managers, Owners	Chrysler Dealerships
Service Managers, Owners	General Motors (GM) Dealerships
Service Managers, Owners	Ford Dealerships
Service Managers, Owners	Toyota Dealerships
Service Managers, Owners	Northern Utah Independent Shops
Andrew Passage	Toyota Motor Sales U.S.A.
Steve Roberts	American Honda Motors, U.S.A.
Steve Taylor	Hyundai Motors America
Jim Clough	Chrysler Corporate Headquarters
George Aiken	GM Corporate Headquarters
Steve Denty	Kia Motors America
David Johnson	Ford Corporate Headquarters
Kathy Ponto	Advantage Technical Resourcing (Ford Hotline)
Automotive Shop Teachers	All Utah and Surrounding States High Schools with Automotive Programs
	Sherwin Williams – Paint Supplies for Collision Program
	Cruse Oil – Annual Automotive Golf Tournament
Steve Hoellein	Felt Auto Parts

Appendix F: External Community Involvement Financial Contributions

Organization	Amount	Type
Sherwin Williams	5000	Scholarship
Advantage Technical Resourcing	1000	Scholarship
Toyota Motor Sales U.S.A	9000	Scholarship
Utah Toyota Dealers	24000	Scholarship

Appendix G: Individual Course Learning Outcomes

Measureable Learning Outcomes

All of the following learning outcomes (tasks) are assessed comprehensively and must be performed by each student in order to move on to the next task, and to pass each class. Each task is assessed with a worksheet specifically designed to assist the student in completing the task and also in assessing their knowledge of the task being performed.

AUSV 20x0 ENGINE PERFORMANCE

For every task in Engine Performance the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

VIII. ENGINE PERFORMANCE

A. General Engine Diagnosis

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
2. Identify and interpret engine performance concern; determine necessary action.
3. Research applicable vehicle and service information, such as engine management system operation, vehicle service history, service precautions, and technical service bulletins.
4. Locate and interpret vehicle and major component identification numbers.
5. Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.
6. Diagnose abnormal engine noise or vibration concerns; determine necessary action.
7. Diagnose abnormal exhaust color, odor, and sound; determine necessary action.
8. Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action.
9. Perform cylinder power balance test; determine necessary action.
10. Perform cylinder cranking and running compression tests; determine necessary action.
11. Perform cylinder leakage test; determine necessary action.
12. Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine necessary action.
13. Prepare 4 or 5-gas analyzer; inspect and prepare vehicle for test, and obtain exhaust readings; interpret readings, and determine necessary action.

14. Verify engine operating temperature; determine necessary action.
15. Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; perform necessary action.
16. Verify correct camshaft timing.

VIII. ENGINE PERFORMANCE

B. Computerized Engine Controls Diagnosis and Repair

1. Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.
2. Diagnose the causes of emissions or driveability concerns with stored or active diagnostic trouble codes; obtain, graph, and interpret scan tool data.
3. Diagnose emissions or driveability concerns without stored diagnostic trouble codes; determine necessary action.
4. Check for module communication (including CAN/BUS systems) errors using a scan tool.
5. Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO); perform necessary action.
6. Access and use service information to perform step-by-step diagnosis.
7. Diagnose driveability and emissions problems resulting from malfunctions of interrelated systems (cruise control, security alarms, suspension controls, traction controls, A/C, automatic transmissions, non-OEM-installed accessories, or similar systems); determine necessary action.
8. Perform active tests of actuators using a scan tool; determine necessary action.
9. Describe the importance of running all OBDII monitors for repair verification.

VIII. ENGINE PERFORMANCE

C. Ignition System Diagnosis and Repair

1. Diagnose ignition system related problems such as no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emissions concerns; determine necessary action.
2. Inspect and test ignition primary and secondary circuit wiring and solid-state components; test ignition coil(s); perform necessary action.
3. Inspect and test crankshaft and camshaft position sensor(s); perform necessary action.
4. Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram as necessary.

VIII. ENGINE PERFORMANCE

D. Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair

1. Diagnose hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine necessary action.
2. Check fuel for contaminants and quality; determine necessary action.
3. Inspect and test fuel pumps and pump control systems for pressure, regulation, and volume; perform necessary action.
4. Replace fuel filters.
5. Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air.
6. Inspect and test fuel injectors.
7. Verify idle control operation.
8. Inspect the integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shield(s); perform necessary action.
9. Perform exhaust system back-pressure test; determine necessary action.
10. Test the operation of turbocharger/supercharger systems; determine necessary action.

VIII. ENGINE PERFORMANCE

E. Emissions Control Systems Diagnosis and Repair

1. Diagnose oil leaks, emissions, and driveability concerns caused by the positive crankcase ventilation (PCV) system; determine necessary action.
2. Inspect, test and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action.
3. Diagnose emissions and driveability concerns caused by the exhaust gas recirculation (EGR) system; determine necessary action.
4. Inspect, test, service and replace components of the EGR system, including EGR tubing, exhaust passages, vacuum/pressure controls, filters and hoses; perform necessary action.
5. Inspect and test electrical/electronic sensors, controls, and wiring of exhaust gas recirculation (EGR) systems; perform necessary action.
6. Diagnose emissions and driveability concerns caused by the secondary air injection and catalytic converter systems; determine necessary action.
7. Inspect and test mechanical components of secondary air injection systems; perform necessary action.
8. Inspect and test electrical/electronically-operated components and circuits of air injection systems; perform necessary action.
9. Inspect and test catalytic converter efficiency.
10. Diagnose emissions and driveability concerns caused by the evaporative emissions control system; determine necessary action.
11. Inspect and test components and hoses of the evaporative emissions control system; perform necessary action.

12. Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine necessary action.

VIII. ENGINE PERFORMANCE

F. Engine Related Service

1. Adjust valves on engines with mechanical or hydraulic lifters.
2. Remove and replace timing belt; verify correct camshaft timing.
3. Remove and replace thermostat and gasket/seal.
4. Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; perform necessary action.
5. Perform common fastener and thread repairs, to include: remove broken bolt, restore internal and external threads, and repair internal threads with a threaded insert.
6. Perform engine oil and filter change.
7. Identify hybrid vehicle internal combustion engine service precautions.

AUSV 25x0 AUTOMATIC TRANSMISSION AND TRANSAXLE

For every task in Automatic Transmission and Transaxle, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

II. AUTOMATIC TRANSMISSION AND TRANSAXLE

A. General Transmission and Transaxle Diagnosis

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
2. Identify and interpret transmission/transaxle concern; differentiate between engine performance and transmission/transaxle concerns; determine necessary action.
3. Research applicable vehicle and service information, such as transmission/transaxle system operation, fluid type, vehicle service history, service precautions, and technical service bulletins.
4. Locate and interpret vehicle and major component identification numbers.
5. Diagnose fluid loss and condition concerns; check fluid level in transmissions with and without a dip-stick; determine necessary action.
6. Perform pressure tests (including transmissions/transaxles equipped with electronic pressure control); determine necessary action.
7. Perform stall test; determine necessary action.
8. Perform lock-up converter system tests; determine necessary action.
9. Diagnose noise and vibration concerns; determine necessary action.
10. Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.
11. Diagnose pressure concerns in a transmission using hydraulic principles (Pascal's Law).
12. Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information.

II. AUTOMATIC TRANSMISSION AND TRANSAXLE

B. In-Vehicle Transmission/Transaxle Maintenance and Repair

1. Inspect, adjust, and replace manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch.
2. Inspect and replace external seals gaskets, and bushings.

3. Inspect, test, adjust, repair, or replace electrical/electronic components and circuits, including computers, solenoids, sensors, relays, terminals, connectors, switches, and harnesses.
4. Diagnose electronic transmission control systems using a scan tool; determine necessary action.
5. Inspect, replace, and align powertrain mounts.
6. Service transmission; perform visual inspection; replace fluid and filters.

II. AUTOMATIC TRANSMISSION AND TRANSAXLE

C. Off-Vehicle Transmission and Transaxle Repair

1. Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pinholes, and mating surfaces.
2. Disassemble, clean, and inspect transmission/transaxle.
3. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, sleeves, retainers, brackets, check valves/balls, screens, spacers, and gaskets).
4. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine necessary action.
5. Assemble transmission/transaxle.
6. Inspect, leak test, and flush or replace transmission/transaxle oil cooler, lines, and fittings.
7. Inspect converter flex (drive) plate; converter attaching bolts, converter pilot, converter pump drive surfaces, converter endplay, and crankshaft pilot bore.
8. Install and seat torque converter to engage drive/splines.
9. Inspect, measure, and reseal oil pump assembly and components.
10. Measure transmission/transaxle endplay or preload; determine necessary action.
11. Inspect, measure, and replace thrust washers and bearings.
12. Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls.
13. Inspect bushings; determine necessary action.
14. Inspect and measure planetary gear assembly components; determine necessary action.
15. Inspect case bores, passages, bushings, vents, and mating surfaces; determine necessary action.
16. Inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform necessary action.
17. Inspect, measure, repair, adjust or replace transaxle final drive components.
18. Inspect clutch drum, piston, check-balls, springs, retainers, seals, and friction and pressure plates; determine necessary action.
1. Measure clutch pack clearance; determine necessary action.
2. Air test operation of clutch and servo assemblies.

3. Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; determine necessary action.
4. Inspect bands and drums; determine necessary action.
5. Describe the operational characteristics of a continuously variable transmission (CVT).
6. Describe the operational characteristics of a hybrid vehicle drive train.

AUSV 12x0 MANUAL DRIVE TRAIN AND AXLES

For every task in Manual Drive Train and Axles, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

III. MANUAL DRIVE TRAIN AND AXLES

A. General Drive Train Diagnosis

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
2. Identify and interpret drive train concern; determine necessary action.
3. Research applicable vehicle and service information, such as drive train system operation, fluid type, vehicle service history, service precautions, and technical service bulletins.
4. Locate and interpret vehicle and major component identification numbers.
5. Diagnose fluid loss, level, and condition concerns; determine necessary action.
6. Drain and fill manual transmission/transaxle and final drive unit.

III. MANUAL DRIVE TRAIN AND AXLES

B. Clutch Diagnosis and Repair

1. Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine necessary action.
2. Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; perform necessary action.
3. Inspect hydraulic clutch slave and master cylinders, lines, and hoses; determine necessary action.
4. Inspect and replace clutch pressure plate assembly, clutch disc, release (throw-out) bearing and linkage, and pilot bearing/bushing (as applicable).
5. Bleed clutch hydraulic system.
6. Inspect flywheel and ring gear for wear and cracks; determine necessary action.
7. Inspect engine block, core plugs, rear main engine oil seal, clutch (bell) housing, transmission/transaxle case mating surfaces, and alignment dowels; determine necessary action.
8. Measure flywheel runout and crankshaft endplay; determine necessary action.

III. MANUAL DRIVE TRAIN AND AXLES

C. Transmission/Transaxle Diagnosis and Repair

1. Remove and reinstall transmission/transaxle.
2. Disassemble, clean, and reassemble transmission/transaxle components.
3. Inspect transmission/transaxle case, extension housing, and case mating surfaces, bores, bushings, and vents; perform necessary action.
4. Diagnose noise concerns using transmission/transaxle power flow principles.
5. Diagnose hard shifting and jumping out of gear concerns; determine necessary action.
6. Inspect, adjust, and reinstall shift linkages, brackets, bushings, cables, pivots, and levers.
7. Inspect, replace, and align powertrain mounts.
8. Inspect and replace gaskets, seals, and sealants; inspect sealing surfaces.
9. Remove and replace transaxle final drive.
10. Inspect, adjust, and reinstall shift cover, forks, levers, grommets, shafts, sleeves, detent mechanism, interlocks, and springs.
11. Measure end play or preload (shim or spacer selection procedure) on transmission/transaxle shafts; perform necessary action.
12. Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings.
13. Diagnose transaxle final drive assembly noise and vibration concerns; determine necessary action.
14. Remove, inspect, measure, adjust, and reinstall transaxle final drive pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case assembly.
15. Inspect lubrication devices (oil pump or slingers); perform necessary action.
16. Inspect, test, and replace transmission/transaxle sensors and switches.
17. Describe the operational characteristics of an electronically controlled manual transmission/transaxle.

III. MANUAL DRIVE TRAIN AND AXLES

D. Drive Shaft and Half Shaft, Universal and Constant-Velocity (CV) Joint Diagnosis and Repair

1. Diagnose constant-velocity (CV) joint noise and vibration concerns; determine necessary action.
2. Diagnose universal joint noise and vibration concerns; perform necessary action.
3. Remove and replace front wheel drive (FWD) front wheel bearing.
4. Inspect, service, and replace shafts, yokes, boots, and CV joints.
5. Inspect, service, and replace shaft center support bearings.
6. Check shaft balance and phasing; measure shaft runout; measure and adjust driveline angles.

III. MANUAL DRIVE TRAIN AND AXLES

E. Drive Axle Diagnosis and Repair

1. Ring and Pinion Gears and Differential Case Assembly

1. Diagnose noise and vibration concerns; determine necessary action.
2. Diagnose fluid leakage concerns; determine necessary action.
3. Inspect and replace companion flange and pinion seal; measure companion flange runout.
4. Inspect ring gear and measure runout; determine necessary action.
5. Remove, inspect, and reinstall drive pinion and ring gear, spacers, sleeves, and bearings.
6. Measure and adjust drive pinion depth.
7. Measure and adjust drive pinion bearing preload.
8. Measure and adjust side bearing preload and ring and pinion gear total backlash and backlash variation on a differential carrier assembly (threaded cup or shim types).
9. Check ring and pinion tooth contact patterns; perform necessary action.
10. Disassemble, inspect, measure, and adjust or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case.
11. Reassemble and reinstall differential case assembly; measure runout; determine necessary action.

2. Limited Slip Differential

1. Diagnose noise, slippage, and chatter concerns; determine necessary action.
2. Clean and inspect differential housing; refill with correct lubricant and/or additive.
3. Inspect and reinstall limited slip differential components.
4. Measure rotating torque; determine necessary action.

3. Drive Axle Shaft

1. Diagnose drive axle shafts, bearings, and seals for noise, vibration, and fluid leakage concerns; determine necessary action.
2. Inspect and replace drive axle shaft wheel studs.
3. Remove and replace drive axle shafts.
4. Inspect and replace drive axle shaft seals, bearings, and retainers.
5. Measure drive axle flange runout and shaft endplay; determine necessary action.

III. MANUAL DRIVE TRAIN AND AXLES

F. Four-wheel Drive/All-wheel Drive Component Diagnosis and Repair

1. Diagnose noise, vibration, and unusual steering concerns; determine necessary action.
2. Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets.

3. Remove and reinstall transfer case.
4. Disassemble, service, and reassemble transfer case and components.
5. Inspect front-wheel bearings and locking hubs; perform necessary action.
6. Check drive assembly seals and vents; check lube level.
7. Diagnose, test, adjust, and replace electrical/electronic components of four-wheel drive systems.
8. Identify concerns related to variations in tire circumference and/or final drive ratios.

AUSV 10x2 SUSPENSION AND STEERING

For every task in Suspension and Steering, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

IV. SUSPENSION AND STEERING

A. General Suspension and Steering Systems Diagnosis

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
2. Identify and interpret suspension and steering system concerns; determine necessary action.
3. Research applicable vehicle and service information, such as suspension and steering system operation, vehicle service history, service precautions, and technical service bulletins.
4. Locate and interpret vehicle and major component identification numbers.

IV. SUSPENSION AND STEERING

B. Steering Systems Diagnosis and Repair

1. Disable and enable supplemental restraint system (SRS).
2. Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring).
3. Diagnose steering column noises, looseness, and binding concerns (including tilt mechanisms); determine necessary action.
4. Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine necessary action.
5. Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine necessary action.
6. Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; perform necessary action.
7. Adjust non-rack and pinion worm bearing preload and sector lash.
8. Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets.
9. Inspect and replace rack and pinion steering gear inner tie rod ends (sockets) and bellows boots.
10. Determine proper power steering fluid type; inspect fluid level and condition.

11. Flush, fill, and bleed power steering system.
12. Diagnose power steering fluid leakage; determine necessary action.
13. Remove, inspect, replace, and adjust power steering pump belt.
14. Remove and reinstall power steering pump.
15. Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment.
16. Inspect and replace power steering hoses and fittings.
17. Inspect and replace pitman arm, relay (center link/intermediate) rod, idler arm and mountings, and steering linkage damper.
18. Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps.
19. Test and diagnose components of electronically controlled steering systems using a scan tool; determine necessary action.
20. Inspect and test electric power assist steering.
21. Identify hybrid vehicle power steering system electrical circuits, service and safety precautions.

IV. SUSPENSION AND STEERING

C. Suspension Systems Diagnosis and Repair

1. Diagnose short and long arm suspension system noises, body sway, and uneven ride height concerns; determine necessary action.
2. Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine necessary action.
3. Remove, inspect, and install upper and lower control arms, bushings, shafts, and rebound bumpers.
4. Remove, inspect and install strut rods and bushings.
5. Remove, inspect, and install upper and/or lower ball joints.
6. Remove, inspect, and install steering knuckle assemblies.
7. Remove, inspect, and install short and long arm suspension system coil springs and spring insulators.
8. Remove, inspect, install, and adjust suspension system torsion bars; inspect mounts.
9. Remove, inspect, and install stabilizer bar bushings, brackets, and links.
10. Remove, inspect, and install strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount.
11. Remove, inspect, and install leaf springs, leaf spring insulators (silencers), shackles, brackets, bushings, and mounts.

D. Related Suspension and Steering Service

1. Inspect, remove, and replace shock absorbers.
2. Remove, inspect, and service or replace front and rear wheel bearings.
3. Test and diagnose components of electronically controlled suspension systems using a scan tool; determine necessary action.

4. Diagnose, inspect, adjust, repair or replace components of electronically controlled steering systems (including sensors, switches, and actuators); initialize system as required.
5. Describe the function of the idle speed compensation switch.
6. Lubricate suspension and steering systems.

IV. SUSPENSION AND STEERING

E. Wheel Alignment Diagnosis, Adjustment, and Repair

1. Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine necessary action.
2. Perform pre-alignment inspection and measure vehicle ride height; perform necessary action.
3. Prepare vehicle for wheel alignment on the alignment machine; perform four-wheel alignment by checking and adjusting front and rear wheel caster, camber; and toe as required; center steering wheel.
4. Check toe-out-on-turns (turning radius); determine necessary action.
5. Check SAI (steering axis inclination) and included angle; determine necessary action.
6. Check rear wheel thrust angle; determine necessary action.
7. Check for front wheel setback; determine necessary action.
8. Check front and/or rear cradle (sub-frame) alignment; determine necessary action.

IV. SUSPENSION AND STEERING

F. Wheel and Tire Diagnosis and Repair

1. Inspect tire condition; identify tire wear patterns; check and adjust air pressure; determine necessary action.
2. Diagnose wheel/tire vibration, shimmy, and noise; determine necessary action.
3. Rotate tires according to manufacturer's recommendations.
4. Measure wheel, tire, axle flange, and hub runout; determine necessary action.
5. Diagnose tire pull problems; determine necessary action.
6. Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly (static and dynamic).
7. Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.
8. Reinstall wheel; torque lug nuts.
9. Inspect tire and wheel assembly for air loss; perform necessary action.
10. Repair tire using internal patch.
11. Inspect, diagnose, and calibrate tire pressure monitoring system.

AUSV 10x1 BRAKES

For every task in Brakes, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

V. BRAKES

A. General Brake Systems Diagnosis

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
2. Identify and interpret brake system concern; determine necessary action.
3. Research applicable vehicle and service information, such as brake system operation, vehicle service history, service precautions, and technical service bulletins.
4. Locate and interpret vehicle and major component identification numbers.

B. Hydraulic System Diagnosis and Repair

1. Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law).
2. Measure brake pedal height, travel, and free play (as applicable); determine necessary action.
3. Check master cylinder for internal/external leaks and proper operation; determine necessary action.
4. Remove, bench bleed, and reinstall master cylinder.
5. Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine necessary action.
6. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; determine necessary action.
7. Replace brake lines, hoses, fittings, and supports.
8. Fabricate brake lines using proper material and flaring procedures (double flare and ISO types).
9. Select, handle, store, and fill brake fluids to proper level.
10. Inspect, test, and/or replace metering (hold-off), proportioning (balance), pressure differential, and combination valves.
11. Inspect, test, and/or replace components of brake warning light system.
12. Bleed and/or flush brake system.
13. Test brake fluid for contamination.

V. BRAKES

C. Drum Brake Diagnosis and Repair

1. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action.
2. Remove, clean, inspect, and measure brake drums; determine necessary action.
3. Refinish brake drum; measure final drum diameter.
4. Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.
5. Inspect and install wheel cylinders.
6. Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings.
7. Install wheel, torque lug nuts, and make final checks and adjustments.

V. BRAKES

D. Disc Brake Diagnosis and Repair

1. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pulsation concerns; determine necessary action.
2. Remove caliper assembly; inspect for leaks and damage to caliper housing; determine necessary action.
3. Clean and inspect caliper mounting and slides/pins for operation, wear, and damage; determine necessary action.
4. Remove, inspect and replace pads and retaining hardware; determine necessary action.
5. Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts.
6. Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads, and inspect for leaks.
7. Clean, inspect, and measure rotor thickness, lateral runout, and thickness variation; determine necessary action.
8. Remove and reinstall rotor.
9. Refinish rotor on vehicle; measure final rotor thickness.
10. Refinish rotor off vehicle; measure final rotor thickness.
11. Retract caliper piston on an integrated parking brake system.
12. Install wheel, torque lug nuts, and make final checks and adjustments.
13. Check brake pad wear indicator system operation; determine necessary action.

V. BRAKES

E. Power Assist Units Diagnosis and Repair

1. Test pedal free travel; check power assist operation.
2. Check vacuum supply to vacuum-type power booster.

3. Inspect the vacuum-type power booster unit for leaks; inspect the check valve for proper operation; determine necessary action.
4. Inspect and test hydraulically assisted power brake system for leaks and proper operation; determine necessary action.
5. Measure and adjust master cylinder pushrod length.

V. BRAKES

F. Miscellaneous (Wheel Bearings, Parking Brakes, Electrical, Etc.) Diagnosis and Repair

1. Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action.
2. Remove, clean, inspect, repack, and install wheel bearings and replace seals; install hub and adjust bearings.
3. Check parking brake cables and components for wear, binding, and corrosion; clean, lubricate, adjust or replace as needed.
4. Check parking brake and indicator light system operation; determine necessary action.
5. Check operation of brake stop light system; determine necessary action.
6. Replace wheel bearing and race.
7. Inspect and replace wheel studs.
8. Remove and reinstall sealed wheel-bearing assembly.

V. BRAKES

G. Electronic Brake, Traction and Stability Control Systems Diagnosis and Repair

1. Identify and inspect electronic brake control system components; determine necessary action.
2. Diagnose poor stopping, wheel lock-up, abnormal pedal feel, unwanted application, and noise concerns associated with the electronic brake control system; determine necessary action.
3. Diagnose electronic brake control system electronic control(s) and components by retrieving diagnostic trouble codes, and/or using recommended test equipment; determine necessary action.
4. Depressurize high-pressure components of the electronic brake control system.
5. Bleed the electronic brake control system hydraulic circuits.
6. Remove and install electronic brake control system electrical/electronic and hydraulic components.
7. Test, diagnose, and service electronic brake control system speed sensors (digital and analog), toothed ring (tone wheel), and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO) (includes output signal, resistance, shorts to voltage/ground, and frequency data).

8. Diagnose electronic brake control system braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.).
9. Identify traction control/vehicle stability control system components.
10. Describe the operation of a regenerative braking system.

AUSV 13x0 and AUSV 21x0 ELECTRICAL/ELECTRONIC SYSTEMS

For every task in Electrical/Electronic Systems, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

VI. ELECTRICAL/ELECTRONIC SYSTEMS

A. General Electrical System Diagnosis

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
2. Identify and interpret electrical/electronic system concern; determine necessary action.
3. Research applicable vehicle and service information, such as electrical/electronic system operation, vehicle service history, service precautions, and technical service bulletins.
4. Locate and interpret vehicle and major component identification numbers.
5. Diagnose electrical/electronic integrity of series, parallel and series-parallel circuits using principles of electricity (Ohm's Law).
6. Use wiring diagrams during diagnosis of electrical circuit problems.
7. Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems, including: source voltage, voltage drop, current flow, and resistance.
8. Check electrical circuits with a test light; determine necessary action.
9. Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs.
10. Check electrical circuits using fused jumper wires; determine necessary action.
11. Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action.
12. Measure and diagnose the cause(s) of excessive parasitic draw; determine necessary action.
13. Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.
14. Inspect and test switches, connectors, relays, solenoid solid-state devices, and wires of electrical/electronic circuits; perform necessary action.
15. Remove and replace terminal end from connector; replace connectors and terminal ends.
16. Repair wiring harness (including CAN/BUS systems).
17. Perform solder repair of electrical wiring.
18. Identify location of hybrid vehicle high voltage circuit disconnect (service plug) location and safety procedures.

VI. ELECTRICAL/ELECTRONIC SYSTEMS

B. Battery Diagnosis and Service

1. Perform battery state-of-charge test; determine necessary action.
2. Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action.
3. Maintain or restore electronic memory functions.
4. Inspect, clean, fill, and/or replace battery, battery cables, connectors, clamps, and hold-downs.
5. Perform battery charge.
6. Start a vehicle using jumper cables or an auxiliary power supply.
7. Identify high voltage circuits of electric or hybrid electric vehicle and related safety precautions.
8. Identify electronic modules, security systems, radios, and other accessories that require re-initialization or code entry following battery disconnect.
9. Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures.

VI. ELECTRICAL/ELECTRONIC SYSTEMS

C. Starting System Diagnosis and Repair

1. Perform starter current draw tests; determine necessary action.
2. Perform starter circuit voltage drop tests; determine necessary action.
3. Inspect and test starter relays and solenoids; determine necessary action.
4. Remove and install starter in a vehicle.
5. Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action.
6. Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition.

VI. ELECTRICAL/ELECTRONIC SYSTEMS

D. Charging System Diagnosis and Repair

1. Perform charging system output test; determine necessary action.
2. Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions.

3. Inspect, adjust, or replace generator (alternator) drive belts, pulleys, and tensioners; check pulley and belt alignment.
4. Remove, inspect, and install generator (alternator).
5. Perform charging circuit voltage drop tests; determine necessary action.

VI. ELECTRICAL/ELECTRONIC SYSTEMS

E. Lighting Systems Diagnosis and Repair

1. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action.
2. Inspect, replace, and aim headlights and bulbs.
3. Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action.
4. Identify system voltage and safety precautions associated with high intensity discharge headlights.

VI. ELECTRICAL/ELECTRONIC SYSTEMS

F. Gauges, Warning Devices, and Driver Information Systems Diagnosis and Repair

1. Inspect and test gauges and gauge sending units for cause of abnormal gauge readings; determine necessary action.
2. Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action.
3. Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action.
4. Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action.

VI. ELECTRICAL/ELECTRONIC SYSTEMS

G. Horn and Wiper/Washer Diagnosis and Repair

1. Diagnose incorrect horn operation; perform necessary action.
2. Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action.
3. Diagnose incorrect washer operation; perform necessary action.

VI. ELECTRICAL/ELECTRONIC SYSTEMS

H. Accessories Diagnosis and Repair

1. Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action.
2. Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action.
3. Diagnose incorrect electric lock operation (including remote keyless entry); determine necessary action.

4. Diagnose incorrect operation of cruise control systems; determine necessary action.
5. Diagnose supplemental restraint system (SRS) concerns; determine necessary action.
6. Disarm and enable the airbag system for vehicle service.
7. Diagnose radio static and weak, intermittent, or no radio reception; determine necessary action.
8. Remove and reinstall door panel.
9. Diagnose body electronic system circuits using a scan tool; determine necessary action.
10. Check for module communication (including CAN/BUS systems) errors using a scan tool.
11. Diagnose the cause of false, intermittent, or no operation of anti-theft systems.
12. Describe the operation of keyless entry/remote-start systems.
13. Perform software transfers, software updates, or flash reprogramming on electronic modules.

AUSV 23x0 HEATING AND AIR CONDITIONING

For every task in Heating and Air Conditioning, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

VII. HEATING AND AIR CONDITIONING

A. A/C System Diagnosis and Repair

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
2. Identify and interpret heating and air conditioning concern; determine necessary action.
3. Research applicable vehicle and service information, such as heating and air conditioning system operation, vehicle service history, service precautions, and technical service bulletins.
4. Locate and interpret vehicle and major component identification numbers.
5. Performance test A/C system; identify A/C system malfunctions.
6. Identify abnormal operating noises in the A/C system; determine necessary action.
7. Identify refrigerant type; select and connect proper gauge set; record temperature and pressure readings.
8. Leak test A/C system; determine necessary action.
9. Inspect the condition of refrigerant oil removed from the system; determine necessary action.
10. Determine recommended oil and oil capacity for system application.
11. Using scan tool, observe and record related HVAC data and trouble codes.

VII. HEATING AND AIR CONDITIONING

B. Refrigeration System Component Diagnosis and Repair

1. Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and PCM) to interrupt system operation; determine necessary action.
2. Inspect and replace A/C compressor drive belts, pulleys, and tensioners; determine necessary action.
3. Inspect, test, and/or replace A/C compressor clutch components and/or assembly; check compressor clutch air gap and adjust as needed.
4. Remove, inspect, and reinstall A/C compressor and mountings; determine required oil quantity.

5. Identify hybrid vehicle A/C system electrical circuits, service and safety precautions.
6. Determine the need for an additional A/C system filter; perform necessary action.
7. Remove and inspect A/C system mufflers, hoses, lines, fittings, O-rings, seals, and service valves; perform necessary action.
8. Inspect A/C condenser for airflow restrictions; perform necessary action.
9. Remove, inspect, and reinstall receiver/drier or accumulator/drier; determine required oil quantity.
10. Remove, inspect, and install expansion valve or orifice (expansion) tube.
11. Inspect evaporator housing water drain; perform necessary action.
12. Remove, inspect, and reinstall evaporator; determine required oil quantity.
13. Remove, inspect, and reinstall condenser; determine required oil quantity.

VII. HEATING AND AIR CONDITIONING

C. Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair

1. Diagnose temperature control problems in the heater/ventilation system; determine necessary action.
2. Perform cooling system pressure tests; check coolant condition, inspect and test radiator, cap (pressure/vacuum), coolant recovery tank, and hoses; perform necessary action.
3. Inspect engine cooling and heater system hoses and belts; perform necessary action.
4. Inspect, test, and replace thermostat and gasket/seal.
5. Determine coolant condition and coolant type for vehicle application; drain and recover coolant.
6. Flush system; refill system with recommended coolant; bleed system.
7. Inspect and test cooling fan, fan clutch, fan shroud, and air dams; perform necessary action.
8. Inspect and test electric cooling fan, fan control system and circuits; determine necessary action.
9. Inspect and test heater control valve(s); perform necessary action.
10. Remove, inspect, and reinstall heater core.

VII. HEATING AND AIR CONDITIONING

D. Operating Systems and Related Controls Diagnosis and Repair

1. Diagnose malfunctions in the electrical controls of heating, ventilation, and A/C (HVAC) systems; determine necessary action.
2. Inspect and test A/C-heater blower, motors, resistors, switches, relays, wiring, and protection devices; perform necessary action.

3. Test and diagnose A/C compressor clutch control systems; determine necessary action.
4. Diagnose malfunctions in the vacuum, mechanical, and electrical components and controls of the heating, ventilation, and A/C (HVAC) system; determine necessary action.
5. Inspect and test A/C-heater control panel assembly; determine necessary action.
6. Inspect and test A/C-heater control cables, motors, and linkages; perform necessary action.
7. Inspect A/C-heater ducts, doors, hoses, cabin filters and outlets; perform necessary action.
8. Identify the source of A/C system odors.
9. Check operation of automatic or semi-automatic heating, ventilation, and air-conditioning (HVAC) control systems; determine necessary action.

VII. HEATING AND AIR CONDITIONING

E. Refrigerant Recovery, Recycling, and Handling

1. Perform correct use and maintenance of refrigerant handling equipment according to equipment manufacturer's standards.
2. Identify and recover A/C system refrigerant.
3. Recycle, label, and store refrigerant.
4. Evacuate and charge A/C system; add refrigerant oil as required.

AUSV 20x0 ENGINE PERFORMANCE

For every task in Engine Performance the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

VIII. ENGINE PERFORMANCE

A. General Engine Diagnosis

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
2. Identify and interpret engine performance concern; determine necessary action.
3. Research applicable vehicle and service information, such as engine management system operation, vehicle service history, service precautions, and technical service bulletins.
4. Locate and interpret vehicle and major component identification numbers.
5. Inspect engine assemblies for fuel, oil, coolant, and other leaks; determine necessary action.
6. Diagnose abnormal engine noise or vibration concerns; determine necessary action.
7. Diagnose abnormal exhaust color, odor, and sound; determine necessary action.
8. Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action.
9. Perform cylinder power balance test; determine necessary action.
10. Perform cylinder cranking and running compression tests; determine necessary action.
11. Perform cylinder leakage test; determine necessary action.
12. Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine necessary action.
13. Prepare 4 or 5 gas analyzer; inspect and prepare vehicle for test, and obtain exhaust readings; interpret readings, and determine necessary action.
14. Verify engine operating temperature; determine necessary action.
15. Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; perform necessary action.
16. Verify correct camshaft timing.

VIII. ENGINE PERFORMANCE

B. Computerized Engine Controls Diagnosis and Repair

1. Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.
2. Diagnose the causes of emissions or driveability concerns with stored or active diagnostic trouble codes; obtain, graph, and interpret scan tool data.
3. Diagnose emissions or driveability concerns without stored diagnostic trouble codes; determine necessary action.
4. Check for module communication (including CAN/BUS systems) errors using a scan tool.
5. Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO); perform necessary action.
6. Access and use service information to perform step-by-step diagnosis.
7. Diagnose driveability and emissions problems resulting from malfunctions of interrelated systems (cruise control, security alarms, suspension controls, traction controls, A/C, automatic transmissions, non-OEM-installed accessories, or similar systems); determine necessary action.
8. Perform active tests of actuators using a scan tool; determine necessary action.
9. Describe the importance of running all OBDII monitors for repair verification.

VIII. ENGINE PERFORMANCE

C. Ignition System Diagnosis and Repair

1. Diagnose ignition system related problems such as no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emissions concerns; determine necessary action.
2. Inspect and test ignition primary and secondary circuit wiring and solid state components; test ignition coil(s); perform necessary action.
3. Inspect and test crankshaft and camshaft position sensor(s); perform necessary action.
4. Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram as necessary.

VIII. ENGINE PERFORMANCE

D. Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair

1. Diagnose hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine necessary action.
2. Check fuel for contaminants and quality; determine necessary action.
3. Inspect and test fuel pumps and pump control systems for pressure, regulation, and volume; perform necessary action.
4. Replace fuel filters.

5. Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air.
6. Inspect and test fuel injectors.
7. Verify idle control operation.
8. Inspect the integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shield(s); perform necessary action.
9. Perform exhaust system back-pressure test; determine necessary action.
10. Test the operation of turbocharger/supercharger systems; determine necessary action.

VIII. ENGINE PERFORMANCE

E. Emissions Control Systems Diagnosis and Repair

1. Diagnose oil leaks, emissions, and driveability concerns caused by the positive crankcase ventilation (PCV) system; determine necessary action.
2. Inspect, test and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action.
3. Diagnose emissions and driveability concerns caused by the exhaust gas recirculation (EGR) system; determine necessary action.
4. Inspect, test, service and replace components of the EGR system, including EGR tubing, exhaust passages, vacuum/pressure controls, filters and hoses; perform necessary action.
5. Inspect and test electrical/electronic sensors, controls, and wiring of exhaust gas recirculation (EGR) systems; perform necessary action.
6. Diagnose emissions and driveability concerns caused by the secondary air injection and catalytic converter systems; determine necessary action.
7. Inspect and test mechanical components of secondary air injection systems; perform necessary action.
8. Inspect and test electrical/electronically-operated components and circuits of air injection systems; perform necessary action.
9. Inspect and test catalytic converter efficiency.
10. Diagnose emissions and driveability concerns caused by the evaporative emissions control system; determine necessary action.
11. Inspect and test components and hoses of the evaporative emissions control system; perform necessary action.
12. Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine necessary action.

VIII. ENGINE PERFORMANCE

F. Engine Related Service

1. Adjust valves on engines with mechanical or hydraulic lifters.
2. Remove and replace timing belt; verify correct camshaft timing.

3. Remove and replace thermostat and gasket/seal.
4. Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; perform necessary action.
5. Perform common fastener and thread repairs, to include: remove broken bolt, restore internal and external threads, and repair internal threads with a threaded insert.
6. Perform engine oil and filter change.
7. Identify hybrid vehicle internal combustion engine service precautions.

ATTC 3000 – Introduction to Automotive Technology

Course Objectives: By the end of this course the student will be able to:

1. WSU Graduation Evaluation training
2. Employability training, driving record, insurance, drug testing, background checks, etc.
3. Resume writing and job interview skills training.
4. Employment file training
5. Online job application training
6. Online networking with www.linkedIn.com
7. Interviewed with potential employers
8. Determined an applicable practicum/Internship to complete in the Summer of 2012
9. Given a report on an automotive employment related topic
10. Prepare for industry standard certifications
    a. ASE certifications
    b. EPA Section 609 certification
    c. Manufacturer certifications

ATTC 3260 – Advanced Electrical Systems

Course Objectives: By the end of this course the student will be able to:

1. Demonstrate knowledge of basic electrical circuits, units of measurement, and electrical testing tools by solving practical problems on a circuit board and in web-based quizzes.
2. Demonstrate how to properly use a Digital Multi Meter (Fluke 87), an Insulation Tester (Fluke 1587), and a Digital Storage Oscilloscope (PicoScope) to properly, safely, and accurately test vehicle electronic circuits.
3. Expand their awareness of the operation and practice the diagnostic routines related to vehicle communication networks. Networks include Environmental Protection Agency's (EPA) regulated Tier-2 Controller Area Network (CAN) and other sub-networks.
4. Expand their awareness of the operation and practice the diagnostic routines related to vehicle body control system networks.

5. Expand their awareness of the operation and practice the diagnostic routines related to vehicle chassis control system networks.
6. Expand their awareness of the operation and practice the diagnostic routines related to vehicle powertrain control system networks.
7. Expand their awareness of the operation and practice the diagnostic routines related to vehicle hybrid control system networks.
8. Expand their awareness of the operation and practice the diagnostic routines related to hybrid vehicle battery control system networks.
9. Enhance their ability to work in harmony and in cooperation with other team members.
10. Expand their awareness and appreciation of professional publications.
11. Present a technical presentation and oral report.

ATTC 3520 – Fleet Management

Course Objectives: At the end of this course you will have:

1. Expand their awareness of government and business fleet employment opportunities.
2. Expand their awareness of government and business fleet standards.
3. Expand their awareness of government and business fleet fixed operations.
4. Expand their awareness of government and business fleet inventory control.
5. Expand their awareness of government and business fleet personnel management.
6. Expand their awareness of government and business fleet financial policies and procedures.
7. Expand their awareness and skills in analyzing fleet financial statements
8. Cultivate the student's awareness of fleet management issues that impact today's society.
9. Enhance their ability to work in harmony and in cooperation with other team members.
10. Expand their awareness and appreciation of professional publications.
11. Present a technical presentation and oral report.

ATTC 3620 – Automotive Business Practices

Course Objectives: By the end of this course, the student will:

1. Expand their awareness of independent shop standards.
2. Expand their awareness of corporate dealership standards.
3. Expand their awareness of corporate dealership inventory control.
4. Expand their awareness of independent shop inventory control.
5. Expand their awareness of corporate dealership personnel management.
6. Expand their awareness of independent shop personnel management.
7. Expand their awareness of corporate dealership financial policies and procedures.

8. Expand their awareness of independent shop financial policies and procedures.
9. Expand their awareness of industry reporting systems**.**
10. Expand their awareness and skills in analyzing fleet financial statements
11. Expand their awareness and appreciation of professional publications.
12. Present a final presentation/oral report.

ATTC 3760 – Advanced Automotive Technologies

Course Objectives: By the end of this course the student will be able to:

1. Expand their awareness and appreciation of professional publications.
2. Determine current National Highway Traffic Safety Administration (NHTSA) Corporate Average Fuel Economy (CAFE) regulations.
3. Determine current U.S. Environmental Protection Agency (EPA) emissions regulations that may impact fuel economy.
4. Determine current National Highway Traffic Safety Administration (NHTSA) Federal Motor Vehicle Safety Standards (FMVSS) regulations that may impact fuel economy.
5. Expand their awareness of the technological advances and changes required to meet the abovementioned standards.
6. Expand their awareness of the advantages/disadvantages of Hybrid and Alternate Fuel Vehicles.
7. Expand their awareness of the types of Hybrid and Alternate Fuel Vehicles.
8. Expand their awareness of the operational systems and characteristics of Hybrid and Alternate Fuel Vehicles.
9. Present a professional technical presentation and oral report of their project.

ATTC 4560 – Advanced Propulsion systems

Course Objectives: By the end of this course the student will be able to:

1. Practice and refine their analytical and diagnostic abilities as they pertain to technical problems.
2. Expand their awareness and appreciation of professional publications.
3. Expand their awareness and understanding of hybrid-electric propulsion systems.
4. Expand their awareness and understanding of plug-in hybrid propulsion systems.
5. Expand their awareness and understanding of electric vehicle propulsion systems.
6. Expand their awareness and understanding of other hybrid propulsion systems.
7. Expand their awareness and understanding of advanced Internal Combustion Engine (ICE) systems.
8. Expand their awareness and understanding of advanced automatic transmission systems.

9. Enhance their ability to work in harmony and in cooperation with other team members.
10. Present a professional technical presentation and oral report of their project.

ATTC 4720 – Capstone Project

Course Objectives: By the end of this course the student will be able to:

1. Define scientific method and scientific inquiry.
2. Determine an applicable technical research project with their assigned team members.
3. Use scientific inquiry and follow the scientific method to conduct an applicable technical research project with their assigned team members.
4. Enhance their ability to work in harmony and in cooperation with other team members.
5. Practice and refine their analytical and diagnostic abilities as they pertain to technical problems.
6. Expand their awareness and appreciation of professional publications.
7. Present a professional technical presentation and oral report of their project.

ATTC 4760 – Alternate Fuel Systems

Course Objectives: By the end of this course the student will be able to:

1. Practice and refine their analytical and diagnostic abilities as they pertain to technical problems.
2. Expand their awareness and appreciation of professional publications.
3. Expand their awareness and understanding of bio-fuel systems.
4. Expand their awareness and understanding of advanced diesel systems.
5. Expand their awareness and understanding of hybrid-electric systems.
6. Expand their awareness and understanding of Compressed Natural Gas (CNG) systems.
7. Expand their awareness and understanding of hydrogen fuel cell systems.
8. Expand their awareness and understanding of other emerging alternate fuel systems**.**
9. Enhance their ability to work in harmony and in cooperation with other team members.
10. Present a professional technical presentation and oral report of their project.

ATTC 4860 – Automotive Laws, Standards, and Regulations

Course Objectives: By the end of this course, the student will be able to:

1. Expand their awareness and appreciation of professional publications.
2. Research current and future Society of Automotive Engineers (SAE) standards that affect motor vehicle design and operation.

3. Research current and future International Standards Organization (ISO) standards that affect the automotive industry.
4. Research the Occupational Safety & Health Administration (OSHA) regulations related to the automotive industry.
5. Research current and future U.S. Environmental Protection Agency (EPA) regulations related to the automotive industry.
6. Research current and future National Highway Traffic Safety Administration (NHTSA) regulations including:
    a. Corporate Average Fuel Economy (CAFE) regulations.
    b. Motor Vehicle Safety Standards (FMVSS) regulations.
    c. Others applicable to the automotive industry.
7. Research state and local regulations related to the automotive industry (www.regulations.gov).
8. Present a professional technical presentation and oral report.