ALLAN HANCOCK COLLEGE

PROGRAM REVIEW

2014-2015

Program Name: Automotive Technology

Self Study Members: Patrick McGuire

DEFINITION AND HISTORY OF THE PROGRAM

The Automotive Technology Program is a hands-on training program that will train you to become a skilled technician in two years or less.
We are the only Automotive Technology training provider at our level in the area.

Students who complete the automotive technology program are encouraged to take the Automotive Service Excellence (ASE) A1 through A8 exams. The following AHC courses prepare students for the related ASE exams:
ASE A1 - Engine Repair: AT 133
ASE A2 - Automatic Transmission/Transaxle: AT 323
ASE A3 - Manual Drive Train & Axles: AT 324
ASE A4 - Suspension & Steering: AT 314
ASE A5 – Brakes: AT 313
ASE A6 - Electrical/Electronic Systems: AT 303
ASE A7 - Heating & Air Conditioning: AT 306
ASE A8 - Engine Performance & Advanced Engine Performance Specialist Certification Test (L1): AT 341, AT 343, AT 344

Completers of the AT306 course will have taken and passed the ASE Refrigerant Recovery and Recycling Review and Quiz. It is an EPA approved program that meets Section 609 regulations from the Clean Air Act Amendments of 1990. This program is intended for technicians servicing motor vehicle air conditioning. See http://www.ase.com/tests/cfc.aspx.

AHC's automotive technology program is a California Bureau of Automotive Repair (BAR) certified Smog Check school offering classes that meet the BAR's requirements for Smog Check Level 1 Inspector, Level 2 Inspector, Inspector Update, Repair Tech. Update, BAR Specified Diagnostic & Repair, Citation, Alternative, Update. Students who complete and pass this training will have met the Bureau's training requirements to take the Smog Check Inspector state licensing examination (http://www.bar.ca.gov/80_BARResources/03_Standards&Training/Course_Descriptions.html).

In addition, all automotive technology students are required to take and pass the S/P2 Safety and Pollution Prevention Mechanical Safety Exam (http://www.sp2.org).

History: Automotive Mechanics began being taught at Santa Maria Junior College in 1927. The program has been a mainstay of the Vocational and Career Technical education offerings since then. Noted accomplishments of our alumni include National Champion of the Vocational and Industrial Clubs of America competition (R. Domingos. 1972) and ASE Technician of the Year (S. Stephen 2008 & Pat Nicoll 2011).

PROGRAM REVIEW

Status Summary - Plan of Action-Post Validation

During the academic year, 2009-10, Automotive Technology completed program review. The self-study and validation teams developed a final plan of action-post validation based on information in the self study and the recommendations of the validation team. For each plan, indicate the action taken, the result of that action, and the current status of the plan, if it is incomplete.

PLAN OF ACTION	ACTION TAKEN, RESULT AND STATUS
Develop Student Learning Outcomes for all courses	All of our courses have outcomes (Update 2010).
Use Student Learning Outcomes in the assessment of the effectiveness of the courses	Identified need for ASE testing center on campus (Update 2010). ASE testing site set up and operational (2011). Used assessments in minor updates to CORs: AT341 Fuel Injection, AT 343 Engine Performance, AT 344 Emission Control/BAR Clean Air Car Course (2011). Identified need for course major modifications (AT133, AT 303, AT 306, AT 334) and new courses (AT336)
Develop Degree and Certificate Outcomes and assessment	Program Outcomes developed (2011). Assessment plan developed (2011)
Identify and address any barriers to degree and certificate completion	Worked with David Hernandez in counseling and as a result in 2013-14 AHC awarded 15.7% of all AS degrees in Automotive Technology and 7% of all certificates requiring 30-60 semester units in the state despite having only 1.5% of the state-wide Auto Tech FTES
Identify and address any deficiencies in the program that might result in barriers to enrollment	Identified need for additional AT100 class offering in order to keep up with student demand (Update 2010). Added 1 new section in Fall 2010, another in Summer 2011, another in Fall 2013 and another in Fall of 14. Plans are to offer 6 sections in Spring of 2015. This is double the offering of Spring 2010. Identified need for Banner to be modified to recognize articulated courses from our feeder high school programs (Update 2010). This issue has been raised with numerous times with admissions/records and counseling with no solution to date. There has been a more than 40% growth in FTES in our program from 2008-09 to 2012-13.
Identify and address any deficiencies in the program that might result in barriers to Student success (language, culture, gender bias).	ASE Testing Center testing on-site request for CTEA grant 2011-12 application denied. Set up center with help from Business Dept. 2012 CTEA Grant 2012-13: Hire a Instructional Assistant for the program to assist the instructor with student oversight in the lab. Permanent Lab assistant position created and filled Spring of 14.
Identify possible new course offerings and investigate student interest.	CTEA Grant 2013-14 Audio Visual Mobile Stations for Labs CTEA Grant 2010-11 Light Diesel Education Purchase diesel powered vehicles and required tools. Offered Powerstroke Diesel Class 3 times with only one section filling.
Identify any new technologies will require addressing in the curriculum	Identified need for new smog test machines (Update 2010). CTEA 14-15 Purchase of Required Smog Inspection Equipment. Identified need for transaxle dynamometer and valve body tester (Update 2010). CTEA 11-12 application denied. Identified need for 4 wheel chassis dynamometer (Update 2010) CTEA 13-14 application denied.

Investigate cooperation with other programs (Auto Body, Welding, Machine Technology, Science, Math, Business) to enhance the curriculum and student outcomes.	CTEA Student Club: Assisted in forming a Student Club to compete in a SkillsUSA Competition. Membership is open to any CTEA students (all disciplines). AT 350 Skills USA Competition Preparation class has been approved.
Contact the Industrial Technology department at Cal Poly to investigate cooperative projects.	This goal was determined to be beyond what could be done at the faculty level.
Continue to work with advisory committee and professional organizations to enhance relationships and student opportunities for employment.	New members added (2011). CTEA Grant 2013-14;Tool Sets for Cooperative Work Experience Students. Meeting with advisory committee Fall 2013 was very productive and resulted in a list of employer identified skills for entry level technicians.
Short term; Minor repair projects need to be addressed	Lab Assistant and student workers are able to assist instructors with lab maintenance and repairs.
Long term; Work with facilities planner and architects on plans for new building.	New building open for classes Fall of 14. We were able to retain the old lab in O-300 in order to accommodate the more than 40% growth in FTES in our program from 2008-09 to 2012-13.
Develop an equipment maintenance and replacement plan	Identified need to provide funding for "AT Tool Storage Project" (Update 2010) AT CTEA Grant 2010-2011. CTEA 09-10 Undercar Update: Purchase of Hydraulic Brake Trainer, Front End Trainer, Task Organizational Storage Equipment and Additional Alignment Equipment. CTEA 09-10 Powertrain Update: Purchase of 2 used OBDII compliant GM vehicles with 3.4 Liter twin cam engines and related special tools and spare parts. CTEA 10-11 Automatic Transmission Update Purchase modern training units in the automatic transmission areas and the required special tools to accompany these units. CTEA 10-11 Scan Tool Software Updates Purchase and install scan tool software updates and emerging new scan tools required for diagnosis, PC computer interface equipment for reprogramming automotive computers. CTEA 13-14 Automotive Scan Tool Replacement: Replace of 10+ year old computer scan tools with current technology capable of reading CAN (2006 and later) vehicles. Equipment Prioritization funds application 2013-14 Alignment Lift and Machine: Purchase of alignment rack and machine to allow each student to perform at least one alignment during a semester
Identify and dispose of obsolete equipment	4 obsolete vehicles, 6 pieces of equipment, 3 tons+ of scrap metal disposed of.
Request lab tech to improve instruction	CTEA Grant 2012-13: Hire an Instructional Assistant for the program to assist the instructor with student oversight in the lab. Permanent Lab assistant position created and filled Spring of 14.

Annual Updates	Changes/Additions/Identified Issues/Results
2010-11	Incorporate the National Automotive Student Skills Standards Assessment (NA3SA) program into the assessment plan. Would require student fees. No Action. New smog machine required for compliance. CTEA application. Need a transmission/transaxle dynamometer. Donation of RWD unit from SBCC. CTEA application (denied). 4 wheel chassis dynamometer. CTEA application (denied). Need additional AT100 class offering in order to keep up with student demand. Sections added.
2011-12	Creation of a computer based testing center for the administration of ASE test on campus. Operational. Banner needs to be modified to recognize articulated courses from our feeder high school programs. No action. Provide funding for "AT Tool Storage Project" (AT CTEA Application 2010-2011). Completed.
2012-13	None

2013-14	Importance of instructors with up-to-date knowledge and skills to teach all courses. (Advisory Board Meeting Fall 12). "Work readiness" skills are needed for all students and are very important to teach in all courses. (Advisory Board Meeting Fall 12). Move into new facility & develop needs list for new facility (completed). Hire 2nd full time faculty (completed Fall of 14). Develop Externship program for instructors. Obtain Access to Old Building O after move in to new facility (completed Fall 14). ASE Introduction of the A9-Light Diesel and L3-Hybrid/Electric Vehicles (2015) will require new courses to cover these subjects. Continuing issues with pre- and co-requisites will require curriculum work. AV in the lab areas was not incorporated into the new building (CTEA Application 2013-14). Part time instructor turnover. ASE Testing Center transition responsibility to AT. Clerical support still only part time.

Allan Hancock College Program Review

Comprehensive Self-Study

I. Program Mission

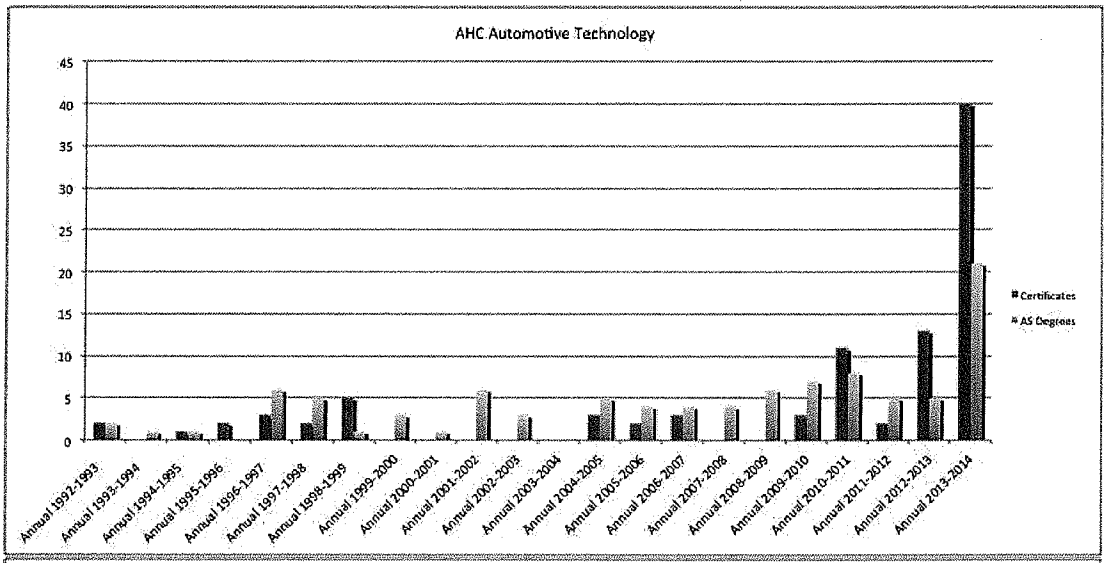
Describe the need that is met by the program or the purpose of the program.

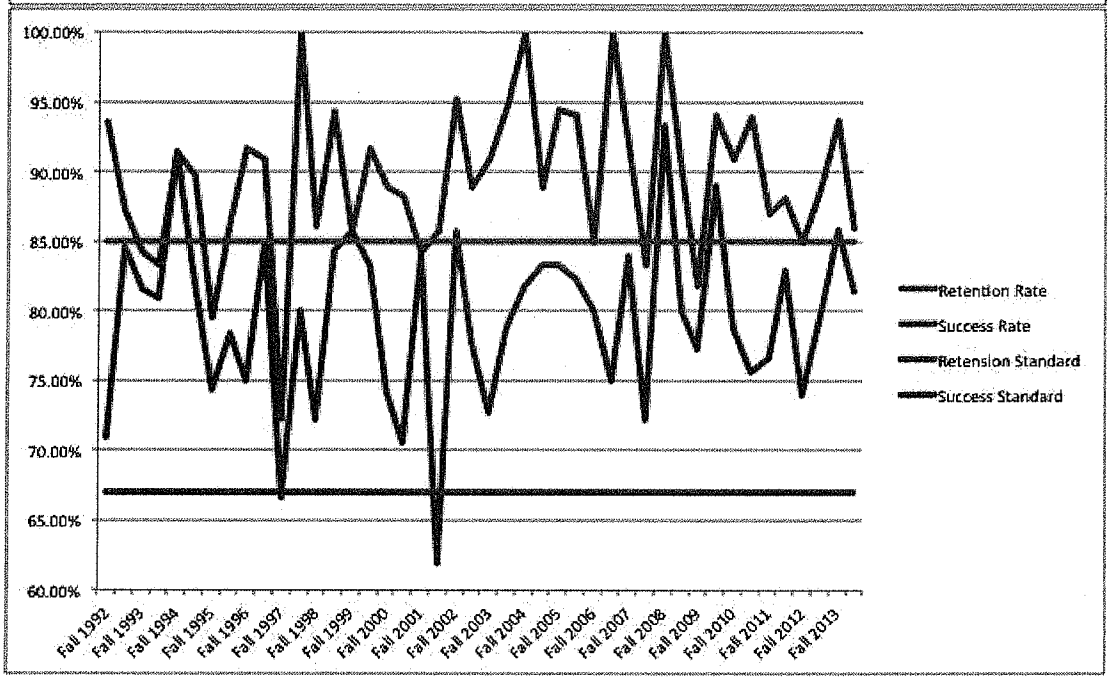
The Automotive Technology Program is a hands-on training program that will train you to become a skilled technician in two years or less.
We are the only Automotive Technology training provider at our level in the area.

II. Progress Made Toward Past Program/Departmental Goals

The Automotive Technology program advances the program, department and institutional goals by providing training and education in a technologically advanced field that continues to show steady growth and employment opportunities for our students.

- The program FTES has grown by 40% since 2008-09 (see exhibits).
- By working with counseling we have seen dramatic increases in degree and certificate attainment for our students. In 2013-14 AHC awarded 15.7% of all AS degrees in Automotive Technology and 7% of all certificates requiring 30-60 semester units in the state despite having only 1.5% of the state wide Auto Tech FTES. In 2013-14 the Automotive Technology program has 1.9% of AHC FTES and awarded 1.8% of all Associate degrees and more than 5% of all Certificates at the college (see exhibits).
- Our retention rates and success rates are above the college standards (see exhibits).
- We have focused on non-traditional students and have been able improve the participation, retention and success of these students. From F2009 to F2014 FTES Female (non-traditional) enrollment increased.





III. Analysis of Resource Use and Program Implementation

- We experienced a dramatic change to the program with the move into the new facility. The amount of work that was concentrated on the move and surrounding issues did have an impact on student learning but the benefits of the new facility have been dramatic. Students no longer have to work around each other in labs and no longer have to sit in a lab for lecture. The atmosphere is much more professional.
- The replacement of the retired full time faculty and the addition of the lab assistant have improved the learning environment.

Continuing issues are;

- Increased competition from other programs has decreased the amount of CTEA funding to the program.
- The lab assistant is only a part time position. We have 6 sections (18 lab hours per week) and only 20 hours for that position. Labs start at 10:30 a.m. and finish at 9:30 p.m. 4 days per week. Our lab assistant is splitting his day in order to cover those labs and we cannot expect him to continue to do that. We need to solve this problem (See Plan Of Action Item 9).
- The division of the lab areas (buildings O-300 and O-200) will continue to be a challenge and will require additional equipment be purchased (See Plan Of Action Item 15).
- The departments' clerical support is still a part-time position and should be restored to full time (See Plan Of Action Item 4).
- The turn over and difficulty in recruiting part time faculty is limiting the growth of the program and has an adverse effect on student learning (See Plan Of Action Item 2).
- Most part time faculty are not ASE certified in the areas they teach as required by NATEF (See Plan Of Action Item 27).
- Increased demands on the time of the faculty in meeting professional responsibilities, outreach activities, oversight of the program and reporting requirements impact student learning. We have not sought to create a coordinator position for this program even though the workload in managing the program would justify it (See Plan Of Action Item 8).
- The increased emphasis at the state and local level to directly tie education to employment, such as with internships and professional certification (ASE) testing, will require more resources (See Plan Of Action Item 10).
- The issue of student safety training and regulatory and legal liability need to be addressed for the entire program and will likely require institutional level resources (See Plan Of Action Item 20).
- The scheduling of classes needs to be addressed. We continue to limit our students' ability to complete degrees and certificates because of the issue of day/evening offerings. The schedule needs to be re-worked so that every class is offered day and evenings in 2 years cycles (See Plan Of Action Item 21 and Attachment "Plan For Future Course Scheduling in Automotive Technology").
- As demonstrated by the granting of a record number of degrees and certificates last year we should have a dedicated CTE counselor or at least a block of counseling time set aside for our students (See Plan Of Action Item 6).
- We continue to receive inquires directly form employers seeking to hire graduates or students and we do not have an organized and professional response to those inquiries (See Plan Of Action Item 7 and Attachment "Plan for Workforce Development").

IV. Program SLOs/Assessment

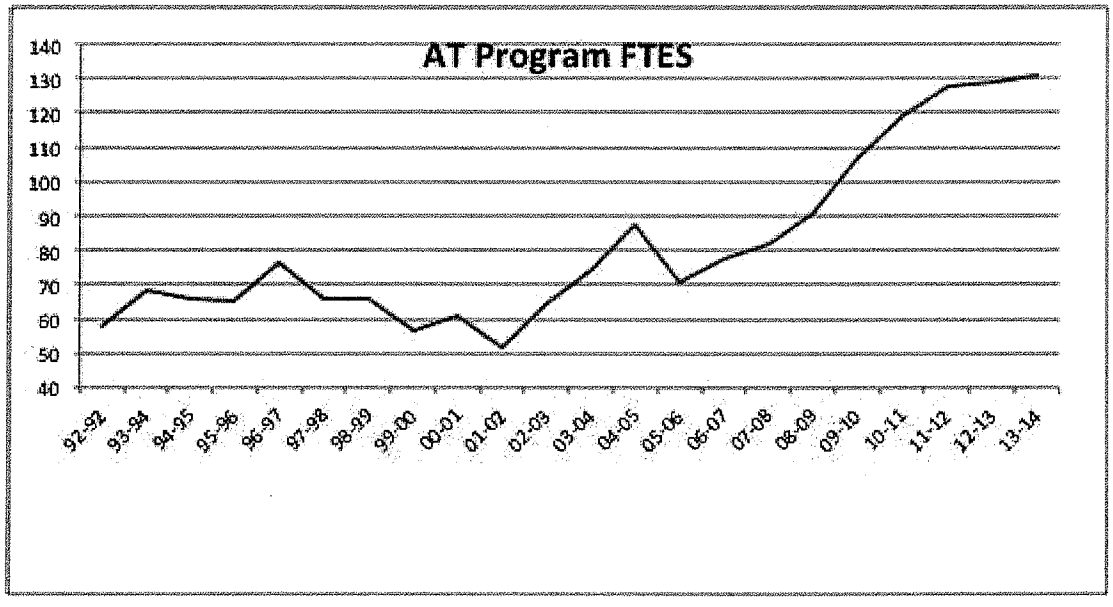
Our Program and Course outcomes have been written and assessed. The results are:

	Exceeds Standard	Meets Standard	Below Standard	Terms w/data
Automotive Technology	43%	34%	23%	62%

The SLOs process has been hampered by the fact that some faculty have not participated.

V. Trend Analyses/Outlook

Student demand for classes is continuing to grow although this may not continue.
Employer demand for the skills we teach continues to grow (See Employment Outcomes and Projections Attachment
The technology required to teach these courses is changing rapidly.
Trade standards continue to evolve.
Regulator requirements in the trade continue to change. Most notably the requirement to obtain a state Smog Inspectors license has been dramatically changed and may have effect on the program.



As applicable, please address the breadth, depth, currency, and cohesiveness of the curriculum in relation to evolving employer needs and/or transfer requirements, as well as other important pedagogical or technology-related developments.

Currently we offer courses that prepare students to obtain trade certification in all 8 Automotive Service Excellence (ASE) automotive areas (A1 through A8) and L1 (Smog). In addition we offer courses for certification in Engine Machining from Automotive Engine Rebuilders Association (AERA). 100% of our courses align with trade certifications.

Curriculum Needs: Uniform course grading and structure, practical exams in each course, laboratory work recorded for each student in all courses, uniform discipline policies. CORs left to update; AT 323. Major Modifications needed: Auto Transmissions/Powertrain. Investigate offerings of new courses: Diesel/Hybrid (ASE A9 and L3) Service Writing (C1). AT100 Outcomes should include "Take and Pass the ASE G1 test. Prerequisites need to be reviewed again. CWE needs to be part of our core courses.

VI. Long-Term Program Goals and Action Plans (Aligned With the College Educational Master Plan)

Students – Need to develop an organized approach to recruiting and retaining non-traditional students (Plan Of Action - Pre-Validation Item #15)
Need to investigate a "lock-step" program for day students – Selection process, scheduling, CWE course to allow those students to complete cert. in 1 year and be place in employment (Denaza style program). (Plan Of Action - Pre-Validation Item #14)
Articulation issues with banner need to be fixed. (Plan Of Action - Pre-Validation Item #13)
Need organized approach to student counseling. (Plan Of Action - Pre-Validation Item #27)
Faculty – ASE Certification for instructors in the areas that they teach (this might require AT100 instructors to be Master Technician Certified). (Plan Of Action - Pre-Validation Item #22)
Facility – Scheduling of classes so that offerings alternate days and nights. (Plan Of Action - Pre-Validation Item #5 and Attachment "Plan For Future Course Scheduling in Automotive Technology")
Equipment – Still need a comprehensive inventory and prioritization of new equipment. (Plan Of Action - Pre-Validation Item #23, 25)
External Relations/Job Placement for students – Need organized approach to Job Placement/Employer contacts. (Plan Of Action - Pre-Validation Item #28 and Attachment "Plan for Workforce Development")

Please see attached Plan Of Action - Pre-Validation

STUDENT DATA SUMMARY

State at least three positive factors about the discipline/program identified by students. Include the number (or percentage) of students responding and any implications for planning.

86.5% of the respondents were "Highly Satisfied" with the "Quality of instructors knowledge within the industry". This is a reflection of the great work by the faculty in the program.

76.9% of the respondents were "Highly Satisfied" with the "The physical facilities and space (e.g., classrooms, labs)". This is a reflection of the improved facilities.

72.3% of the respondents were "Highly Satisfied" with the "Quality of instruction within the program".

71.6% would "recommend taking courses in the Automotive Technology Program".

29.1% of the 104 respondents said that they are "currently employed in the Automotive Industry". This indicates that many of our students are here seeking to improve their skills.

State at least three negative factors about the discipline/program identified by students. Include the number (or percentage) of students responding and any implications for planning.

Only 38.1% of our students were "Highly Satisfied" with the "Advice about the program from counselors" with 6% "Not at All" satisfied. See Plan Of Action.

About 21% were only "Moderately" or "Not At All" satisfied with the "The availability of courses offered in the Automotive Technology Program". See Plan Of Action.

About 20% were only "Moderately" or "Not At All" satisfied with the "Instructional equipment (e.g., computers, lab equipment)". See Plan Of Action.

About 13-14% were only "Moderately" satisfied with the "Feedback and assessment of progress towards learning objectives" and "Clarity of course goals and learning objectives". See Plan Of Action.

State any other information (use responsive numbers) that you obtained from student data (e.g. focus groups, questionnaires, or SGIDs) that may be of special interest to the self study team. What planning implications will result from this information?

SGIDs done during faculty evaluations identified our computer system (availability and speed) as a major issue. (See Plan Of Action Item 9).

15% or 16 students of the 103 surveyed have taken ASE exams. 22% were the A4 Suspension and 20% were the A5 Brakes exams. None have taken the A9 Light Diesel (no course offering) and only 2% have taken the A7 Air Conditioning exam.

About 60% of our students have completed 30 units or less and about 60% are part time students.

ALTERNATIVE FORMAT; PLAN OF ACTION - PRE-VALIDATION

Area	Item #	Action	Referenced in Educational Master Plan:	Specific Steps for Program:	Primary Responsibility of:	Working with:	Identified by:	Evidenced by	Resources required	Time Line
Curriculum Development and Improvement	1	Incorporate CWE course into curriculum	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"	Modify Degrees and Certificates, recruit advisors and employers	Faculty	Administration	Administration	CTE/Employer initiatives	Stipend	F15
	2	Modify AT323 COR	Strategic Direction: Student Learning & Success: Goal SLS2: To support student access, achievement, and success	Major Course Modification	Faculty		Accreditation	CORs to be up to date	Stipend	F15
	3	Modify AT100 outcomes to include G1 test	Strategic Direction: Student Learning & Success: Goal SLS2: To support student access, achievement, and success	Modify Course SLOs	Faculty	Program	Trade/Advisory Committee	Student skills and knowledge entering employment and advanced classes	None	F15
	4	Create automated method of recording student lab work	Strategic Direction: Student Learning & Success: Goal SLS1: To ensure continuous improvement based on Student Learning	Write requests for funds (CTEA Grant Application, equipment prioritization)	Program	Faculty	Trade/Advisory Committee	Student skills and knowledge entering employment	Unknown	F15
	5	Change schedules of courses	Student Success: Initiative Four: "providing students opportunities to advance their education ... in a timely fashion."	Plan 2 year cycle of courses	Faculty		Students	Student Survey; Availability of Classes	None	F15
	6	Create practical exams for all classes	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"	Modify Course SLOs	Faculty	Program	Trade/Advisory Committee	AT100 SLOs Course Improvement Plan F11 & Student skills and knowledge entering employment	None	S16
	7	Standardize grading/rubrics/student communication	Strategic Direction: Student Learning & Success: Goal SLS1: To ensure continuous improvement based on Student Learning Outcomes assessment data.	Survey faculty, formulate standards, modify syllabi	Program	Faculty	Students	AT100, AT133 SLOs Course Improvement Plan F13 & Student Survey: Low satisfaction with communication of and feedback on objectives	None	S16
	8	Create new Light Diesel Course	Department Identified Specific Facilities Needs: Possible program expansion for Auto Tech to diesel and hybrid	Write New Course	Faculty		Trade/Advisory Committee	Creation of A9 test, Increase in LD vehicles on the road	Stipend	F16
	9	Modify AT323 and AT324 courses	Strategic Direction: Student Learning & Success: Goal SLS2: To support student access, achievement, and success	Major Course Modification	Faculty		Trade/Advisory Committee	AT 323 SLOs Course Improvement Plan F13 AT 324 SLOs Course Improvement Plan S12	Stipend	F16
	10	Modify pre- and co-requisites	Student Success: Initiative One: "streamline the transition from high school to college"	Major Course Modification	Faculty		Faculty	Student skills and knowledge entering advanced classes	Stipend	F16
	11	Create new Hybrid/Electric Vehicle Course	Department Identified Specific Facilities Needs: Possible program expansion for Auto Tech to diesel and hybrid	Write New Course	Faculty		Trade/Advisory Committee	Creation of L3 test, Increase in Hybrid vehicle fleet	Stipend	F17
	12	Create new Service Consultant course	Strategic Direction: Student Learning & Success: Goal SLS2: To support student access, achievement, and success	Write New Course	Faculty		Trade/Advisory Committee	C1 test, employer inquiries	Stipend	F17
Enrollment and Retention	13	Banner Modification	Student Success: Initiative One: "streamline the transition from high school to college"	Research issue with Admissions and Records, I.T., Counseling, present results to Administration	Administration	Program	Students	Students having to do waivers from articulated H.S. courses.	None	?
	14	Investigate creating a "Course Sequence Contract" for students	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"	Research CC programs that have that system, disseminate results, survey students/faculty/advisors, formulate plan	Program	Administration	Trade/Advisory Committee	Student skills and knowledge entering employment	None	?
	15	Address non-traditional student enrollment and retention	Student Success: Initiative Three: "expanded access ... and services for underserved populations"	Research issue and formulate plan.	Administration	Faculty	Administration	CTEA District Negotiated Targets	Unknown	F15
Support and Improvement of Quality Instruction	16	Address instructor turnover	Strategic Direction: Institutional Resources: Goal IR1: To recruit and retain quality employees.	Research issue with H.R., Equivalency Committee of A.S., present results to Administration.	Administration	Program	Students	AT 323& AT 343 SLOs Course Improvement Plans S12 & Student Survey; Availability of Classes	Unknown	?
	17	Increase lab assistant position hours	Student Success: Initiative Three: "expanded access ... and services for underserved populations"	Assist with documenting justification.	Administration		Faculty	AT 303 SLOs Course Improvement Plan F11, AT313 & AT 314 SLOs Course Improvement Plans F13	$30,000	?
	18	Investigate creation of Coordinator position for program	Strategic Direction: Student Learning & Success: Goal SLS2: To support student access, achievement, and success	Research comparable departments on campus. Present results to administration.	Administration	Program	Students	Student Survey: Low satisfaction with outside services (counseling, testing center, coordination with other programs)	Unknown	?
	19	Address deficient computer access in labs	Technology Master Plan Goals: 2. Have technology systems that are reliable ...	Write requests for funds (CTEA Grant Application, equipment prioritization), Inventory and Technology Plan	Administration	Faculty	Students	Student Survey: Low satisfaction with computer access and speed	Unknown	S15
	20	Develop Externship program for instructors	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"	Research opportunities and solicit involvement of local employers.	Program	Faculty	Trade/Advisory Committee	Advisory committee: Instructors should have real-world experience	Unknown	F15
	21	Address Student Safety Training	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"	Write standards, identify assessment, modify syllabi	Faculty	Administration	Trade/Advisory Committee	Auto Tech Program SLO 8: "Demonstrate the use of the proper procedure for dealing with hazards encountered in the automotive repair work place" assessed F13 and 17% Did Not Meet Standard.	Unknown	F15
	22	Certification for all instructors in their areas	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"	Survey faculty, seek support and funding	Program	Faculty	Trade/Advisory Committee	Advisory committee: Instructors should have real-world experience	Unknown	F16
	23	Dispose of obsolete equipment	Strategic Direction: Institutional Resources: Goal IR4: To provide a safe, attractive, and accessible physical environment	Inventory and write Surplus Property forms	Program	Administration	Administration	Facilities	None	F15
	24	Purchase needed equipment for both main lab areas	Strategic Direction: Institutional Resources: Goal IR3: To enhance and maintain currency in technology	Write requests for funds (CTEA Grant Application, equipment prioritization)	Program	Administration	Trade/Advisory Committee	Student skills and knowledge entering employment	Unknown	F15
	25	Create a Equipment Prioritization list	Strategic Direction: Institutional Resources: Goal IR3: To enhance and maintain currency in technology	Identify new and replacement equipment needs.	Program	Faculty	Administration	AT 341 SLOs Course Improvement Plan F12 & CTEA and Equipment Prioritization	None	F15

ALTERNATIVE FORMAT; PLAN OF ACTION - PRE-VALIDATION

Support Student Success	26	Restore department clerical support to full time	Student Success: Initiative Three: "restoring critical services that have been cut due to budget deficits."	Assist with documenting justification.	Administration		Faculty		$30,000	?
	27	Obtain Educational Plan for all program students	Student Success: Initiative One: "streamline the transition from high school to college" & Student Success: Initiative Four: "providing students opportunities to advance their education ... in a timely fashion."	Assist with documenting justification.	Administration		Students	"Program" work listed is above and beyond faculty contract & Student Survey: Low satisfaction with outside services (counseling, testing center, coordination with other programs)	Unknown	?
	28	Organize response to employer inquiries	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"	Assist with documenting justification.	Administration	Program	Administration	CTE/Employer initiatives	Unknown	?
	29	Form and Support Skills USA chapter	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"	Recruit advisor, integrate with Skills Prep. courses.	Faculty	Program	Students	Interest of students in Skills USA meetings	None	F15
	30	Organize Auto Tech operation of ASE Testing Center	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"	Identify needed equipment/software/location. Request resources.	Administration	Program	Trade/Advisory Committee	Student skills and knowledge entering employment	Unknown	F16

PROGRAM REVIEW -- VALIDATION TEAM MEMBERS

TO: Academic Dean Larissa V. Nazarenko Date: 10/13/14

From: Patrick McGuire, Automotive Technology

We recommend the following persons for consideration for the validation team:

DEPARTMENT Industrial Technology PROGRAM Automotive Technology

Board Policy requires that the validation team be comprised of the dean of the area, one faculty member from a related discipline/program, and two faculty members from unrelated disciplines.

Robert Mabry	Machine Technology
(Name)	(Related Discipline/Program)
Nancy Joe Ward	Fine Arts
(Name)	(Unrelated Discipline/Program)
Marla Allegre	English
(Name)	(Unrelated Discipline/Program)

At the option of the self-study team, the validation team may also include one or more of the following: a. someone from a four-year institution in the same discipline; someone from another community college in the same discipline; a high school instructor in the same discipline; a member of an advisory committee for the program. Please complete the following as relevant to your program review.

(Name) (Title)

Affiliation: Telephone Contact Number:

Address
(Mailing) City/State/Zip email address

(Name) (Title)

Affiliation: Telephone Contact Number:

Address
(Mailing) City/State/Zip email address

(Name) (Title)

Affiliation: Telephone Contact Number:

Address
(Mailing) City/State/Zip email address

APPROVED: 6/1/15
Academic Dean Date

EXECUTIVE SUMMARY

Validation Team Report

Automotive Technology

1. MAJOR FINDINGS

Strengths of the program

Faculty

- The dedicated full-time faculty are engaged, innovative and have a passion for teaching while giving direction to the program and setting a high standard.
- The replacement of the retired full-time faculty and the addition of the lab assistant have improved the learning environment.
- The hiring of the new instructional lab assistant proctors for the ASE test on campus has helped maintain connection with the industry.

Facilities

- The recent move into the new Industrial Technology building has provided more instructional space for labs and classrooms. This has dramatically changed the educational experience for students.
- State of the art technology and facilities, with the exception of (non completed items)
- Purchased and updated equipment in the program by successfully using CTEA grant funds, equipment prioritization and donations over the past several years.

Enrollment

- There has been a 40% growth since 2008-2009 while the college was cutting sections due to budgetary constraints.
- Due to an exceptional collaboration with a CTE counselor David Hernandez, degree and certificate attainment have been dramatically increased. In 2013-2014 AHC awarded 15% of all AS degrees in Automotive Technology in the state.

- More than 70% of students are highly satisfied with the quality of the instructors' knowledge, physical facilities, and quality of instruction.

- About 30% of the students are currently employed in the industry and sign up for Automotive Technology classes to build their skills.

- The program serves a large number of young students under the age of 19. The majority of the students' population is made up primarily of Hispanic male.

- The retention and success rates are higher than the college's overall.

Concerns of the Program

- The Banner software that the college uses does not recognize articulated courses with feeder high schools. This creates barriers when students register for classes.

- The AV in the lab areas were not incorporated into the new building which created challenges teaching labs. The white boards are behind the screens.

- Department clerical supports continues to be an issue especially with a part time secretary.

- The instructor lab assistant is a part-time employee. With the increased sections of the beginning level courses, the part time employee does not have enough hours and availability which creates safety issues.

- There is a lack of instructors in the area who meet the Minimum Qualifications to teach classes within the discipline. This is a strong justification to hire a third full-time instructor to meet the demand and maintain a high level of instruction.

- Capturing the employment data continues to be an issue. Currently, sources report different and sometimes contradicting information. Traditionally the data captured is only geared towards those completing the program.

2. RECOMMENDATIONS

➢ The Validation Team recommends that the faculty continue to work closely with the counseling department to ensure that qualified students obtain a degree or certificate.

- The Validation Team recommends that the program create a better organized response system to improve relations with industry partners and to match placement of qualified students in internship jobs and potential job offers.

- The Validation Team recommends that the program coordinate the internships to be able to control quality and track student employability.

- The Validation Team recommends that the faculty work closely with the college to modify banner to ensure that students are getting credit for articulated courses.

- The Validation Team recommends that the faculty work with the college to schedule regular Safety Tests, which is listed as a "Limitation on Enrollment" for several courses.

- The Validation Team supports the need to advocate for a full-time position for the department secretary.

- The Validation Team supports the need to explore the possibility for a third full-time instructor.

- The Validation Team recommends that the program find sustainable funding for proctoring the ASE test. Also, the ASE testing location should be moved to the O-100 CAD labs.

VALIDATION TEAM SIGNATURE PAGE

Nancy Jo Ward, Instructor, Graphics Design

Marla Allegre, Instructor, English

Robert Mabry, Instructor, Machine Technology

Larissa Nazarenko, Interim Dean, Academic Affairs

Automotive Technology Plan of Action - Post Validation

During the Self Study, the program developed a Plan of Action based on 30 identified needs. After receiving the Validation Team report the following Plan of Action was developed. There are four areas addressed:

1. **Program Alignment to Student Enrollment and Retention Needs**
    a. AP&P Course Modifications: Advisories changed to prerequisites.
    b. Memo: Dissemination of the appeal process to all instructors.
    c. Investigate placing a statement into the Banner course description:
    d. Communicate to all the importance of granting appeals
    e. Schedule visitations to each area high school once per year.
    f. Lobby for recognizing articulated course credit from high schools.
    g. Communicate the process for recording credit for AT100 requirement.
    h. Lobby Counseling to commit resources to create an EP for each student.
2. **Program Workforce Development and Student Placement Assistance**
    a. Modify the Certificates and Degrees to give credit for CWE149
    b. Communicate to high schools work experience opportunities
    c. Establishing and maintaining relationships with local employers
    d. Work with CJPC staff to streamline the process of job posting
    e. Require students in advanced courses to complete and post a resume.
3. **Program Operation Improvement**
    a. Seek an additional full time faculty position
    b. Seek restoration of the Department Secretary to Full Time status
    c. Seek change of Lab Assistant position to full time status
    d. Seek budget monies to fund 20 hours per week of student worker time
    e. Formulate a plan with IT to restore student computer access
    f. Seek support for moving the ASE testing to building O-100
    g. Purchase and install replacement and new equipment.
4. **Program Instruction Improvement**
    a. Change all Course SLOS to reflect certification tests as an outcome.
    b. Establish the practice and provide the equipment for practical exams
    c. Establishing common rubrics, assessments, outcomes and standards
    d. Enable instructors to do externships
    e. Establish a procedure for new course introduction
    f. Establish a Skills USA chapter

The following are specifics including narratives justifying the need, costs etc. Accomplishing many of these items will require resources but all will require support from outside the program. Gaining this support entails much work on the part of the full time faculty, administrators and staff. We appreciate the support we have received in the past and are looking forward to accomplishing these goals with your help.

Area	1. Program Alignment to Student Enrollment and Retention Needs
Referenced in Educational Master Plan:	Strategic Direction: Student Learning & Success: Goal SLS2: To support student access, achievement, and success Student Success: Initiative Four: "providing students opportunities to advance their education ... in a timely fashion." Student Success: Initiative Three: "expanded access ... and services for underserved populations"
Specific Steps for Program:	Complete Major Course Modifications, Create Course Scheduling Matrix, Work with local High Schools on recruitment and to ensure articulation of students into advanced classes, work with Counseling to see that each student has an Educational Plan in place,
Primary Responsibility of:	Faculty
Working with:	AP&P and Counseling and Administration, High Schools
Identified by:	Validation Team Report Items 1, 4, 7
Evidenced by	Course Review, Student Survey; Availability of Classes, Students having to do waivers from articulated H.S. courses.
Resources required	Stipend, additional full time faculty
Time Line	Beginning F15

Narrative:
The Course Review identified 7 courses that will need to have Major Modifications done to incorporate prerequisites and limitations on enrollment. In the past faculty were concerned about placing prerequisites on courses because of the high numbers of returning students who have work experience in the trade. With prerequisites they were forced into taking classes they did not need. Because the appeal requires the student to see a counselor and because of impacted classes this often resulted in being wait-listed or preclude from enrollment altogether. Because of this and the uncertainty of future offerings some students ignore the advisories. These students require an inordinate amount of instructor attention and face a much more difficult semester than those who follow the advisories.

The scheduling of classes in the program has been problematic in the past. Because of the availability of faculty many of the courses were only taught at night or during the day and students had difficulty scheduling around other commitments. With the addition of the 2nd full time faculty some of this has been resolved but many of the advanced classes are still taught by part time faculty that have limited availability. The Course Scheduling Matrix has already been developed (see "Plan for Future Course Scheduling" attachment) and will be in use for Fall 2015 semester. Much of this schedule depends on qualified faculty being available. Either more of the part time faculty will need the become qualified to teach advanced classes (ASE certified in that area) or we will need to seek a 3rd full time faculty position for the program.

The issue of the full time to part time faculty also effects recruitment of students, including non-traditional students. With 2 full time faculty the 4 hours of available professional responsibility time per week is typically used in committee meetings on campus. The department depends on full time faculty to represent them in the various governance bodies on campus. This limits the amount of time that can be spent on out-reach.

The issue of articulated high school courses being recognized as satisfying the prerequisite requirements during the students initial enrollment has created issues for many potential students. Currently they must schedule an appointment with a counselor in order for that "attribute" to be put into Banner. Again this delays their enrollment and results in them being wait-listed. At a minimum we will need to contact all of the area high school instructors and explain the process and forms. This will also involve close coordination with A&R and Counseling.

In previous years a highly successful campaign to develop educational plans (EPs) for each Automotive Student resulted in a record-breaking number of degrees and certificates. The need is still there but Counseling has been unable to render the assistance that the students need. One option is to assign each Automotive Technology student a "faculty advisor" that they must meet with each semester to review their progress and plan future that students next semester schedule.

Specific action to be taken:

a. AP&P Course Modifications: Advisories changed to prerequisites.
b. Memo: Dissemination of the prerequisite appeal process to all instructors.
c. Investigate placing a statement into the Banner course description: "The prerequisite requirements are in place to insure student success in this course. If you feel that prior educational or work experience has prepared you adequately for this course please see the instructor to discuss appealing of the prerequisite requirement."
d. Communicate to all faculty, Counseling and Administration the importance of granting appeal due to the high number of working students seeking to improve their skills and not concerned with gaining a degree or certificate. Currently the "Prerequisite/Corequisite/Placement Appeal" form is not available on myHancock or the regular web site (dead end link).
e. Prioritize faculty professional responsibility hours on local high school visitations and outreach with a focus on non-traditional student recruitment. Schedule visitations to each area high school once per year.
f. Lobby for a smother process of recognizing articulated course credit from high schools.
g. Communicate to all area high schools the process for recording the incoming students completion of the required courses to meet the AT100 requirement.
h. Lobby Counseling to commit resources to create an EP for each student.

Area	2. Program Workforce Development and Student Placement Assistance
Referenced in Educational Master Plan:	Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning"
Specific Steps for Program:	Modify Degrees and Certificates to incorporate CWE course into curriculum, develop and maintain relationships with employers, assist students and employers with placements
Primary Responsibility of:	Faculty
Working with:	Administration, Staff
Identified by:	Validation Team Report Items 2 & 3, "Plan For Workforce Development" attachment
Evidenced by	Statewide CTE/Employer initiatives, area students attending For-Profit colleges.
Resources required	Stipend through CWE 149, Course Modification Stipend
Time Line	Beginning F15

Narrative:
One of the unique things about the Automotive Technology program is that we can make direct comparisons with private, for-profit colleges; (Universal Technical Institute and WyoTech). Their strategy of partnering with industry in cooperative education, internships and placement has been a very successful and powerful tool in recruitment of the top high school students in the area. Despite their ongoing legal and financial issues, these schools continue to use placement and internships to draw away some of the best and brightest students from our area and to gain support from local high school instructors and counselors.

The creation of a formal structure to identify students who are suitable candidates, pair them with suitable employers, monitor the outcomes and revise and improve the process is critical to the success of the program. The Career Work Experience (CWE) 149 course is currently the best vehicle to accomplish this.
Currently we are working with the CWE coordinator and a dealership group to streamline the process, we have purchased 4 tool sets through CTEA for the students to use in the workplace and we will be asking for approval of a course substitution of CWE149 in place of AT 389 (Special Projects) and AT 399 (ASE Prep) in the Fall of 2015.

Many employers approach faculty and staff seeking suitable candidates for full time positions. In the past there has been a haphazard approach that relied on the relationships between students and faculty and employers and faculty. The Career/Job Placement Center maintains a portal to an on-line job board. Guiding

employers and students through the process of registering and posting on this site has led to mixed results.

Specific action to be taken:

a. Modify the Certificates and Degrees through AP&P to give credit in the major for CWE149. We will need to decide if this is a requirement or an elective course inside the major.
b. Communicate to all of the local high schools through our program recruitment literature and publications the work experience and placement opportunities that our program offers.
c. Encourage and assist all program faculty in establishing and maintaining relationships with local employers by making it clear that this work meets their Professional Responsibility contract requirement and should be considered in their evaluations.
d. Work with CJPC staff to streamline the process of job and student resume posting and retrieval.
e. Require students in advanced courses to complete and post a resume.

Area	3. Program Operation Improvement
Referenced in Educational Master Plan:	Strategic Direction: Institutional Resources: Goal IR1: To recruit and retain quality employees. Strategic Direction: Student Learning & Success: Goal SLS2: To support student access, achievement, and success Technology Master Plan Goals: 2. Have technology systems that are reliable Strategic Direction: Institutional Resources: Goal IR4: To provide a safe, attractive, and accessible physical environment Student Success: Initiative Three: "restoring critical services that have been cut due to budget deficits."
Specific Steps for Program:	Address instructor turnover by seeking a 3rd Full Time faculty position, address the need for program support (student safety testing, ASE testing, purchasing, etc.) by seeking the change of the Department Secretary and Lab Assistant positions to Full Time status and the budgeting of a Student Worker specifically to the program, Address the IT issues in the program by seeking assistance in restoring computer access, Relocate the ASE testing center to building O-100, seek adequate funding for capital equipment replacement and upgrades.
Primary Responsibility of:	Faculty
Working with:	Administration, Staff, IT
Identified by:	Students, Faculty, Advisory Committee
Evidenced by	Course Improvement Plans, Advisory Committee, Student Survey,

	Validation Team Report items 5,6 and 7
Resources required	$150,000/year personnel costs, $45,000 to $75,000/year for equipment replacement and upgrade
Time Line	F15

Narrative:

For Fall of 2015 semester the program will teach a load of about 6. The 2 full time instructors will teach about 1.4 each leaving the majority of the load to the part time instructors. Of the 9 instructors scheduled for F15, only 4 were on the schedule in F13. It is something to consider when you realize that our student retention rate is better than our instructor retention rate. Below is a graphical representation of the instructors (numbered) length of service.

Inst.	S11	F11	S12	F12	S13	F13	S14	F14	S15	F15
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
Total	6	5	7	7	6	6	6	8	9	9

While this appears to show the situation stabilized, I can say with a high degree of certainty that 4 semesters from now we will not have the same group of instructors.

Because much of what we teach is sequential and involves conditioning the students to think and behave in particular ways, the methodologies of the program instructors have to evolve together and in an organized manner. The new instructors have to be introduced to those methods and have to be given time to incorporate them into their teaching. Turnover and the lack of clear lines of authority inside the program undermine this evolution and lead to inconsistent learning outcomes for the students. With growing pressure to add and update

curriculum and the NATEF requirement that all instructors be ASE certified in their areas this effect will only increase.

We need to seek the addition of a 3rd full time instructor. Given the difficulty in finding qualified instructors, risk classes being canceled and students EPs being upset and the overall quality of the program being put at risk by the uncertainties that come with having a majority of instruction being delivered by part timers, this is the only viable, long-term solution. Given the need for full time faculty all over campus this is the ultimate long shot but it is what needs to happen.

The operation of the Automotive Program is similar in many ways to the operation of a small business. Scheduling, purchasing, completing required reports and applications, equipment maintenance, repair and replacement, etc. are all tasks that must be done in order for the "work" of teaching to happen. These support activities are critical and requires staff who are directly involved in the day-to-day operations of the program.

Presently the support of the program falls on the department secretary, the laboratory assistant and student workers. The department secretary has been a critical part of the programs' past success and has allowed faculty to focus on the job of teaching. This position needs to be restored to a full-time position in order to keep up with growth in the department programs and to allow faculty to focus on their teaching.

The addition of the part time Laboratory Assistant to the program has improved instruction and resulting outcomes. He has assisted in creating an organized and productive learning environment that has resulted in better outcomes for students and allowed instructors time to focus on students. He has also been instrumental in organizing the Safety Test and insuring that each AT100 student take and passes this. In addition he has proctored all the ASE professional certification test and established this as a strong link between the college and the local employers and workforce. This should be turned into a full time position or at a minimum a second Lab Assistant should be hired.

The student workers in the program have helped the instructors and lab assistant to maintain the quality of instruction but funding has been sporadic and most times has to be split with the other programs in the department. We need to establish the budget for 20 hours per week of student assistant time specific to the program.

One of the largest sources of student dissatisfaction in the program has been the computer system. After the move was complete the lab computers were extremely slow and there are now fewer computers for students to access than before. IT is aware of this and has promised to address the issues. We will develop a technology plan and work with IT to restore student access to computers that they need to complete lab work.

The creation of a satellite Prometrics testing center on campus has allowed the program to offer ASE certification to our students and to the community at large. The nationally recognized ASE Certification is often cited by employers as a primary qualification of job applicants, more so than a degree or certificate. Taking and passing the ASE test is a specific Student Learning Outcome in most of our courses and giving our students the opportunity to take the tests in a familiar setting in a timely manner has improved this critical measure. Currently the center is located in K building and is only available when that room is available. Moving the center to O-100 will allow for more flexibility and efficiency in scheduling tests.

Our program is equipment-intensive. A rough but conservative estimate of the replacement cost of all equipment in the program would be $1.5 million dollars. It is impossible to know what exactly we will need to replace or purchase over the next 5 years but using industry standards we can estimate that our capital equipment replacement and upgrade costs will be 3 and 5% per year.

Specific action to be taken:

a. Seek an additional full time faculty position through the Faculty Prioritization process
b. Seek restoration of the Department Secretary position to Full Time status
c. Seek change of Lab Assistant position to full time status or the creation of a second position
d. Seek budget monies to fund 20 hours per week of student worker time
e. Formulate a plan with IT to restore student computer access in the new building
f. Seek support for moving the Prometrics Testing Center for ASE testing to building O-100
g. Identify, find funding for purchase and install replacement and new equipment.

Area	4. Program Instruction Improvement
Referenced in Educational Master Plan:	Strategic Direction: Student Learning & Success: Goal SLS1: To ensure continuous improvement based on Student Learning Outcomes assessment data. Strategic Direction: Student Learning & Success: Goal SLS2: To support student access, achievement, and success Student Success: Initiative Two: Integrated Learning Experiences. "real-world or hands-on learning" Department Identified Specific Facilities Needs: Possible program expansion for Auto Tech to diesel and hybrid
Specific Steps for Program:	Change to all course SLOs to incorporate professional certification, create practicum assessments in each course, standardize grading rubrics across the program, enable instructors to perform

	externships, introduce new curriculum to the program, establish the Skills USA chapter
Primary Responsibility of:	Faculty
Working with:	AP&P, SLOs Coordinator, Administration, outside faculty, employers
Identified by:	Students, Advisory Committee,
Evidenced by	Course Improvement Plans, Student Survey, Advisory Committee
Resources required	Course Creation Stipend, compensation for part time instructors for program standard development, externship stipends, club advisor stipend
Time Line	F15 on

Narrative:
The success of the program depends on our reputation with employers, students and the community. Real skills are our product and imparting those skills to students is our job. In a class of 25 students knowing that each an every one of them has gained the knowledge and skills the employers need in an employee is a very difficult task. The professional certification tests offered by ASE are the standard not only in this industry but in almost every skilled trade. If our students pass these test they can say that they possess the knowledge to perform the job. Currently most of the advanced class Student Learning Outcomes contain wording to the effect of "prepare the students to take an pass the ASE exam" for that subject. The exception is the AT100 Introductory course. Recently ASE introduced the ASE G1 certificate that tests for general maintenance knowledge. This needs to be incorporated into the AT100 course SLOs.

What ASE testing cannot measure is the hands-on skills of the students. This requires careful observation and analysis of the student during the performance of a real-world task. With the current structure the students perform laboratory exercises and the instructor observes, assists and grades their performance. Often the students work in groups and the dynamics dictate that some students will gain more than others. Instructors often know that some students lack the desired skills but they do not have a way to objectively assess this. We need to establish a methodology to assess students hands-on skills. Currently we are working on setting up a video recording station where students can perform a task and the instructor can later observe and assess their performance. Once a successful structure is established this needs to be incorporated into all courses.

Because of high turnover in the instructor pool many different grading rubrics have developed and the resulting confusion among students is causing dissatisfaction. Outcomes are sometimes not clearly communicated, some instructors are viewed as harder or easier and the perception of the quality of instruction by the students is degraded. Because of the nature of the command chain all work in this area needs to be by consensus but because most instruction is delivered by part time instructors who are not required or compensated to attend program meetings,

building a consensus is impossible. We need to have a program meeting to work on common rubrics, assessments, outcomes and program development. This will require compensating part time faculty for this time.

The development of knowledge, skills and attitudes in students requires that instructors have real-world experience in the trade. All instructors have work experience in the field but for many it has been years since they have been employed. Externships would allow instructors to familiarize themselves with current shop practices and would translate into improved outcomes for students.

The trade is constantly changing and the program must keep up to date with those changes. Introducing new curriculum into the program is a problem because of scheduling, staffing and facilities. We need to establish a plan to introduce new courses into the program with a minimum of disruption and maximum flexibility. This may be through a "Emerging Technology" course or, if demand warrants, a new core course. Again this should be through a consensus of the faculty and the advisory committee working through the AP&P process.

One of the most visible aspects of CTE programs is the participation in skills competition. Students gain experience, instructors are motivated and we are able to show the results of our work in a concrete manner. Skills USA is that vehicle and we need to establish a Skills USA chapter on campus. This may require the establishment of a stipend for the advisor. It will definitely require the cooperation of administration and faculty form outside the program.

Specific action to be taken:

a. Change all Course SLOS to reflect passing professional certification tests as an outcome.
b. Establish the practice and provide the equipment for all instructors to administer practical exams
c. Hold a Automotive Technology Program Development meeting to build consensus on establishing common rubrics, assessments, outcomes and standards
d. Enable instructors to do externships
e. Establish a procedure for new course introduction
f. Establish a Skills USA chapter

PLAN OF ACTION – Post-Validation

Review and Approval

Plan Prepared By

Patrick McGuire _____ Date: 5/21/15

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

Reviewed:

Eric Mason, ~~Department~~ Chair, Industrial Technology

_____ Date: 5/28/15

*Signature of Department Chair indicates approval by department of Plan of Action.

Reviewed:

Larissa Nazarenko, Interim Dean of Academic Affairs

_____ Date: 5/21/15

_____, Vice President, Academic Affairs

_____ Date: 6/1/15

Suggestions For Improving The Process

In looking back at the program review process the things that stand out besides the large volume of work involved are the opportunity to hold forth our accomplishments and the sometimes painful task of self-assessment for the program. Pointing out our successes affirms the institutional-wide investment of time and energy into the program and acknowledgement of shortcomings is not easy but it is the only path to improvement.

But all of this work is wasted if not acted on. In manufacturing there is a saying: Measuring by itself never improves quality. The feedback loop of measure, change, re-measure has to be established and followed for it to be effective and this applies to the Program Review process as well. In looking at the Action Plan it becomes clear that "change" part of the loop must involve those above the program level.

In enterprise management there is a primary rule: Do not hold a person accountable for things over which they have no control. So the Action Plan, the real map to improvement, should be divided into things the program can accomplish on it's own and those things that must involve outside resources and staff. In accepting the Action Plan the administration should be agreeing to provide that required support. And if the program is held to account for those internal changes then so should the administration be accountable for those outside changes.

The Final Plan of Action should be a list of specific steps with responsible parties named. That should include the Dean over the program.
As an example:
"Create a CTE specific counselor position to assist each program student with formulating an Educational Plan"
The steps would be:
Faculty will document justification for counselor position
Department Chair will bring position to prioritization process
Dean will seek funding and lobby for position

In accepting the POA all parties are agreeing to be accountable and they all should be required to report on progress in the Annual Update. If the administrator does not agree with an action item then they should have the authority to amend or remove that item.

Also, because of the difference between Academic and CTE programs, holding programs to the same standards in accountability and reporting should be looked at carefully. Academic programs often have an overabundance of talent in report writing and research. CTE programs have personnel that are technical experts but not necessarily the best report writers. The Program Review Resource Guide needs to be re-written with that fact in mind.

This suggestion should be taken seriously as there is the perception amongst Career and Technical Education faculty that there is a negative bias against CTE programs in the academic community. We are not only held accountable for student learning

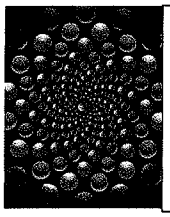
but also for student training, employability and employment. In academic programs it is accepted that many students are not prepared for the program entrance courses and an entire infrastructure is set up to deal with these students. Placement testing, remedial classes, counseling and tutoring all are tailored primarily serve the academic programs. And while CTE students benefit from these services it is by accident and not by design. There are no paid tutors for micrometer reading.

One example where we could make the process easier would be in the Course Review. The curriculum tracking software should be able to extract a list of program courses with Prerequisites, Corequisites and Advisories etc. in a table form. Also the SLOs assessment schedule should be extractable from the software. A few changes to automate some of the reporting would allow more time for faculty to focus on the real benefit of assessing the program and creating goals.

Another area for improvement would be in the IRP Tableau Reports where it is unclear on why some of the data is needed. The presentation of that data also should be improved as many tables end up in 2 parts on separate pages.

One final note: In joining the Academic Senate Program Review Committee I had the goal of reducing the amount of work in the process. I can say now that I have put in more hours than I ever intended but the result was valuable and has resulted in a clearer picture of where the program has been, where it needs to go and how to get there.

Attachment 1



ASSESSMENT SCHEDULE

6 Year

AHC Program Student Learning Outcomes

6 Year Assessment Schedule

The attached template provides a framework for a program/discipline to plan a 6 year schedule for assessing its student learning outcomes, completing the SLO assessment cycle and attaining the status of ***sustainable continuous quality improvement*** in institutional effectiveness. This plan may be updated over the next 6 years as new contingencies or interpretations arise.

PROGRAM: **Automotive Technology**

Our program is pleased to present our ***plan*** to: assess our SLOs, review the results of that assessment; and discuss changes to our curriculum, pedagogy or operations based on the results.

Program/ discipline coordinator or team leader: Patrick Mc Guire _____ 5/28/15
Name Signature Date

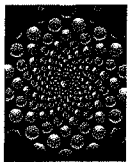
I have reviewed this plan and agree that it provides sufficient detail and is a feasible approach to comprehensively assess the program SLOs.

Department chair: _____ Eric C. Mason 5/28/15
Name Signature Date

I have reviewed this plan and agree that it provides sufficient detail and is a feasible approach to comprehensively assess the program SLOs.

Dean: Larissa Nazarenko _____ 6/1/15
Name Signature Date

Attachment 1



ASSESSMENT SCHEDULE 6 Year Fall 14 – Spring 20	Program: Automotive Technology	page __1__ of ___13__

Use one row for each Program and Course SLO

SLO	To be assessed in semester:	Assessment method (s)	Team to review assessment results	Resources needed to conduct assessment	Individual responsible for assessment report	Date we expect to complete review
AT100 SLO1 - Demonstrate safe procedures for using the equipment and tools in the automotive shop.	Fall 14	SP2 Safety Test Score	Program SLOs Coordinator, FT Faculty, Instructor		Instructor of Record for that semester	
AT100 SLO2 - Where to find the correct repair and maintenance procedures and specifications for passenger cars and light trucks.	Spring 15	Service Information Lab				
AT100 SLO3 - The correct application and usage of the tools encountered in the diagnosis, repair and maintenance of passenger cars and light trucks.	Spring 2020	Tool Lab				
AT100 SLO4 - The proper procedures for diagnosis, repair and maintenance of passenger cars and light trucks.	Fall 15	Lab Exam		AV equipment to record student lab work		
AT100 SLO5 - Safely and successfully complete simple diagnosis, repairs and maintenance of a passenger car or light truck through the correct application of procedures, specifications and tools.	Spring 16	Diagnostic Testing				

Attachment 1

~~AT100 SLO6~~ (revised/eliminated)						
~~AT100 SLO7~~ (revised/eliminated)						
~~AT100 SLO8~~ (revised/eliminated)						
AT100 SLO9 - Meet educators and employers expectations for active and productive participation in group tasks.	Fall 16	Attendance/ Participation grade				
AT100 SLO10 - Meet educators and employers expectations of individual work quality, output, participation and ethical behavior.	Spring 17	Lab Notebook				
AT100 SLO11 - Define the correct terminology for the parts, components, systems and tools encountered in the diagnosis, repair and maintenance of a passenger car or light truck.	Fall 17	Part ID Lab				
AT100 SLO12 - The impact that transporting people and goods has on the economy and the environment.	Spring 18	Exam Question				
AT100 SLO13 - Document through written records your work in the diagnosis, repair and maintenance of a passenger car or light truck.	Fall 18	Work Orders		Work order tracking software		
AT100 SLO14 - Minimize the impact your activities have on the environment.	Spring 19	Exam Question				
AT133 SLO1 - Identify safe and unsafe procedures for the repair of the automobile engine and its related components.	Fall 14	Lab Observation		AV equipment to record student lab work		
AT133 SLO2 - Identify where to find the correct procedures and specifications for the repair of automotive engine and its	Fall 15	Service Information Lab		Work order tracking software		

Attachment 1

related components.						
AT133 SLO3 - Explain the proper procedure for using the tools involved in the repair of the automotive engine and its related components	Fall 16	Exam Question				
AT133 SLO4 - Describe the proper procedure for diagnosing problems with the automotive engine and its related components.	Fall 17	Exam Question				
AT133 SLO5 - Demonstrate the ability safely complete the repair of automotive engines.	Fall 18	Lab Observation		AV equipment to record student lab work		
AT133 SLO6 - Demonstrate the ability to properly use the tools involved in the repair of the automotive engine and its components.	Fall 19	Lab Observation		AV equipment to record student lab work		
AT133 SLO7 - Demonstrate the ability to diagnose problems with the automotive engine.	Fall 20	Lab Observation		AV equipment to record student lab work		
AT133 SLO8 - Demonstrate the ability to work on automotive engines with accuracy, dependability, proficiency and in a timely and safe manner	Fall 14	Lab Observation		AV equipment to record student lab work		
AT133 SLO9 - Demonstrate the ability to work independently and in groups to service, repair, test, and maintain the systems of the automotive engines	Fall 15	Team Exercise		AV equipment to record student lab work		
AT133 SLO10 - Demonstrate the ability to meet employer expectations for employees within the automotive engine repair workplace	Fall 16	Attendance Score				
AT303 SLO1 - use good work habits and safety practices while performing lab work.	Fall 14	Lab Observation		AV equipment to record student lab work		
AT303 SLO2 - select and use the correct tools and diagnostic	Spring 15	Diagnostic Lab				

Attachment 1

equipment.						
AT303 SLO3 - identify and analyze a series, parallel, and series-parallel circuit.	Fall 15	Circuit Lab				
AT303 SLO4 - analyze, evaluate and solve electrical problems through the application of OHM's Law.	Spring 16	Ohms Law Labs				
AT303 SLO5 - analyze, evaluate, and solve electrical system faults through the application of voltage drop tests	Fall 16	Voltage Drop Lab				
AT303 SLO6 - perform battery and cranking circuit tests, analyze the results, estimate and perform all required repairs	Spring 17	Lab Observation		AV equipment to record student lab work		
AT303 SLO7 - perform A.C. and D.C. charging system test, analyze the results, estimate and perform all required repairs.	Fall 17	Lab Observation		AV equipment to record student lab work		
AT303 SLO8 - analyze, evaluate and repair automotive wiring and accessory circuit problems using wiring schematics, OHM's Law, and voltage drop test procedures.	Spring 18	Lab Observation		AV equipment to record student lab work		
AT306 SLO1 - describe the condensing unit cycle.	Spring 15	Exam Questions				
AT306 SLO2 - diagnose cause of failure of the condensing unit to cool the automobile.	Spring 16	Lab Observation		AV equipment to record student lab work		
AT306 SLO3 - use proficiently Halogen leak Detector, electrical test equipment, manifold gauge sets and special tools.	Spring 17	Lab Observation		AV equipment to record student lab work		
AT306 SLO4 - flush, evacuate and recharge the condensing unit.	Spring 18	Lab Observation		AV equipment to record student lab work		
AT306 SLO5 - replace a clutch, clutch bearing and compressor	Spring 19	Lab Observation		AV equipment to record student lab		

Attachment 1

seal.				work		
AT313 SLO1 - Identify safe and unsafe procedures for the repair of the automobile brake system and its related components.	Fall 14	Lab Observation		AV equipment to record student lab work		
AT313 SLO2 - Identify where to find the correct procedures and specifications for the repair of the automotive brake system and its related components.	Fall 15	Specifications Lab				
AT313 SLO3 - Explain the proper procedure for using the tools involved in the repair of the brake system and its related components.	Fall 16	Exam Questions				
AT313 SLO4 - Describe the proper procedure for diagnosing problems with the automotive brake system and its related components.	Fall 17	Exam Questions				
AT313 SLO5 - Demonstrate the ability safely complete the repair of the brake systems.	Fall 18	Lab Observation		AV equipment to record student lab work		
AT313 SLO6 - Demonstrate the ability to properly use the tools involved in the repair of the brake system and its components.	Fall 19	Lab Observation		AV equipment to record student lab work		
AT313 SLO7 - Diagnose problems with the brake system.	Fall 20	Lab Observation		AV equipment to record student lab work		
AT313 SLO8 - Demonstrate the ability to work on the brake system with accuracy, dependability, proficiency and in a timely and safe manner.	Fall 14	Lab Notebook		Work order tracking software		
AT313 SLO9 - Demonstrate the ability to work independently and in groups to service, repair, test, and maintain the automotive brake system.	Fall 15	Lab Observation		AV equipment to record student lab work		

Attachment 1

AT313 SLO10 - Demonstrate the ability to meet employer expectations for employees within the automotive brake system repair workplace.	Fall 16	Attendance				
AT314 SLO1 - Identify safe and unsafe procedures for repairing all the components in the suspension and steering systems.	Spring 15	Exam Questions				
AT314 SLO2 - Identify where to find the correct procedures and specifications for the suspension and steering systems.	Spring 16	Specifications Lab				
AT314 SLO3 - Explain the proper procedure for using the tools involved in the repair of the suspension and steering systems.	Spring 17	Exam Questions				
AT314 SLO4 - Describe the proper procedure for diagnosing problems with the suspension and steering systems.	Spring 18	Exam Questions				
AT314 SLO5 - Demonstrate the ability to safely complete the repair of any suspension and steering system.	Spring 19	Lab Observation		AV equipment to record student lab work		
AT314 SLO6 - Demonstrate the ability to properly use the tools involved in the repair of the suspension and steering systems.	Spring 20	Lab Observation		AV equipment to record student lab work		
AT314 SLO7 - Diagnose problems with the suspension and steering systems.	Spring 15	Lab Observation		AV equipment to record student lab work		
AT314 SLO8 - Demonstrate the ability to work on suspension and steering systems with accuracy, dependability, proficiency and in a timely and safe manner.	Spring 16	Lab Observation		AV equipment to record student lab work		
AT314 SLO9 - Demonstrate the ability to work independently and	Spring 17	Lab Notebook				

Attachment 1

in groups to service, repair, test, and maintain vehicle suspension and steering systems.						
AT314 SLO10 - Demonstrate the ability to meet employer expectations for employees within the automotive industry workplace.	Spring 18	Attendance				
AT323 SLO1 - diagnose and overhaul four types of drivelines.	Fall 14	Lab Observation		AV equipment to record student lab work		
AT323 SLO2 - diagnose and overhaul intregel and removable carrier differentials.	Fall 15	Lab Observation		AV equipment to record student lab work		
AT323 SLO3 - diagnose and overhaul a four-speed constant mesh transmission.	Fall 16	Lab Observation		AV equipment to record student lab work		
AT323 SLO4 - diagnose and overhaul manual transaxle.	Fall 17	Lab Observation		AV equipment to record student lab work		
AT323 SLO5 - diagnose and overhaul a clutch.	Fall 18	Lab Observation		AV equipment to record student lab work		
AT323 SLO6 - diagnose and overhaul a four-wheel drive front axle assembly.	Fall 19	Lab Observation		AV equipment to record student lab work		
AT323 SLO7 - diagnose and overhaul a four-wheel drive transfer case.	Fall 20	Lab Observation		AV equipment to record student lab work		
AT323 SLO8 - service an automatic transmission.	Fall 14	Lab Observation		AV equipment to record student lab work		
AT324 SLO1 - Perform assignments using technical reference data.	Spring 15	Exam Questions				
AT324 SLO2 - Troubleshoot automatic transmission and transaxle problems and failures.	Spring 16	Lab Observation		AV equipment to record student lab work		
AT324 SLO3 - Overhaul an automatic transmission.	Spring 17	Lab Observation		AV equipment to record student lab		

Attachment 1

				work		
AT324 SLO4 - Overhaul an automatic transaxle.	Spring 18	Lab Observation		AV equipment to record student lab work		
AT324 SLO5 - Service several automatic transmissions and transaxles.	Spring 19	Lab Observation		AV equipment to record student lab work		
AT324 SLO6 - Bench and dynamometer test and apply theoretical principles to automatic transmissions.	Spring 20	Lab Observation		AV equipment to record student lab work		
AT324 SLO7 - Be prepared to pass the ASE A2 test.	Spring 15	Final Exam				
AT334 SLO1 - Identify safe and unsafe procedures for machining components in the automobile.	Fall 14	Lab Observation		AV equipment to record student lab work		
AT334 SLO2 - Identify where to find the correct procedures and specifications for the mechanical repair of automotive engine and	Fall 15	Lab Observation		AV equipment to record student lab work		
AT334 SLO3 - Explain the proper procedure for using the tools involved in the mechanical repair of the automotive engine and its related components.	Fall 16	Exam Questions				
AT334 SLO4 - Describe the proper procedure for diagnosing mechanical problems with the automotive engine and its related components.	Fall 17	Exam Questions				
AT334 SLO5 - Demonstrate the ability safely complete the machining of automotive engine components.	Fall 18	Lab Observation		AV equipment to record student lab work		
AT334 SLO6 - Demonstrate the ability to properly use the tools involved in the mechanical repair of the automotive engine and its	Fall 19	Lab Observation		AV equipment to record student lab work		
AT334 SLO7 - Diagnose mechanical	Fall 20	Exam				

Attachment 1

problems with the automotive engine.		Questions				
AT334 SLO8 - Demonstrate the ability to work on automotive engines with accuracy, dependability, proficiency and in a timely and	Fall 14	Lab Observation		AV equipment to record student lab work		
AT334 SLO9 - Demonstrate the ability to work independently and in groups to service, repair, test, and maintain the mechanical systems of the automotive engines.	Fall 15	Lab Notebook				
AT334 SLO10 - Demonstrate the ability to meet employer expectations for employees within the automotive machining shop.	Fall 16	Attendance				
AT336 SLO1 - Identify safe and unsafe procedures used in the course of engine output measurement.	Spring 15	Exam Questions				
AT336 SLO2 - Identify where to find the correct procedures and specifications for the machining and measurement of engines.	Spring 16	Lab Notebook				
AT336 SLO3 - Explain the proper procedure for using the tools involved in engine output measurement.	Spring 17	Exam Questions				
AT336 SLO4 - Describe the proper procedure for diagnosing mechanical problems with the automotive engine that prevent optimized engine efficiency and output.	Spring 18	Exam Questions				
AT336 SLO5 - Demonstrate the ability to properly use the tools involved in engine output measurement.	Spring 19	Lab Observation		AV equipment to record student lab work		
AT336 SLO6 - Demonstrate the	Spring 20	Lab		AV equipment to		

Attachment 1

ability to prepare and measure engines for optimized efficiency and output with accuracy, dependability, proficiency and in a timely and safe manner		Observation		record student lab work		
AT336 SLO7 - Demonstrate the ability to work independently and in groups to prepare and measure engines for optimized efficiency and output.	Spring 15	Lab Notebook				
AT336 SLO8 - Demonstrate the ability to meet employer expectations for employees within the trade.	Spring 16	Attendance				
AT341 SLO1 - Analyze engine performance and fuel systems complaints using technical data.	Fall 14	Lab Observation		AV equipment to record student lab work		
AT341 SLO2 - Analyze and perform repairs on fuel system related problems using scan tools and engine performance special tools.	Fall 15	Lab Observation		AV equipment to record student lab work		
AT341 SLO3 - Analyze and repair fuel storage and supply systems.	Fall 16	Lab Observation		AV equipment to record student lab work		
AT341 SLO4 - Perform on-car engine performance adjustments.	Fall 17	Lab Observation		AV equipment to record student lab work		
AT341 SLO5 - Diagnose, evaluate and repair fuel injection and turbocharging systems as applied to late model Domestic, Asian, and European vehicles	Fall 18	Exam Questions				
AT343 SLO1 - Analyze engine performance faults using technical data.	Spring 15	Lab Observation		AV equipment to record student lab work		
AT343 SLO2 -Analyze and repair ignition faults using a scan tool and digital storage oscilloscope.	Spring 16	Lab Observation		AV equipment to record student lab work		

Attachment 1

AT343 SLO3 - Perform ignition and fuel system adjustments.	Spring 17	Lab Observation		AV equipment to record student lab work		
AT343 SLO4 - Analyze and repair solid state ignition systems including enhanced and distributor ignition systems.	Spring 18	Lab Observation		AV equipment to record student lab work		
AT343 SLO5 - Diagnose common computerized engine control system faults and perform required repairs.	Spring 19	Exam Questions				
AT343 SLO6 -Verify and repair engine performance complaints using common road test, scan tool, and scope testing methods	Spring 20	Lab Observation		AV equipment to record student lab work		
AT344 SLO1 - Interpret Bureau of Automotive (BAR) Repair Smog Check rules and regulations.	Spring 15	Exam Questions				
AT344 SLO2 - Use technical data to identify vehicle emission control system applications.	Spring 16	Lab Observation		AV equipment to record student lab work		
AT344 SLO3 - Perform vehicle emission control system device visual and functional inspection.	Spring 17	Lab Observation		AV equipment to record student lab work		
AT344 SLO4 - Perform a complete vehicle smog check inspection in training mode.	Spring 18	Lab Observation		AV equipment to record student lab work		
AT344 SLO5 - Develop computerized engine controls system operation and diagnostic skills.	Spring 19	Exam Questions				
AT344 5LO6 - Apply BAR update training skills in the lab on training vehicles.	Spring 20	Lab Observation		AV equipment to record student lab work		
AT344 SLO7 - Prepare for and complete all required Clean Air Car Course certification exams.	Spring 2014	Exam				

Attachment 1

AT PSLO 1: Demonstrate an understanding of the importance of customer satisfaction and the role it plays in the success of a business in the automotive service industry.	Fall 14	Lab and Classroom Observation				
AT PSLO 2: Demonstrate an understanding of the various business models in the automotive service industry.	Spring 15	Exam Questions				
AT PSLO 3: Demonstrate the ability to effectively communicate verbally and in writing with customers, co-workers and the employer.	Fall 15	Lab Work				
AT PSLO 4: Demonstrate the ability to diagnose problems with the various systems of the automobile using systematic procedures and logical methods.	Spring 16	Lab Work				
AT PSLO 5: Demonstrate the ability to identify what technical specifications are needed, where to find them and how to use them in the course of performing their duties.	Fall 16	Lab Work				
AT PSLO 6: Demonstrate an understanding of the legal and ethical issues encountered in the automotive repair workplace and make responsible decisions.	Spring 17	Lab and Classroom Observation				
AT PSLO 7: Demonstrate the required mechanical skills and the ability to use the trade tools at a level of proficiency that is expected in the profession.	Fall 17	Lab Work				
AT PSLO 8: Demonstrate the use of the proper procedure for dealing with hazards encountered in the automotive repair work place.	Spring 18	Lab Observation				

Attachment 1

Attachment 1

AT PSLO 9: Demonstrate the ability to perform all of the NATEF tasks in each of the core courses in the option or certificate.	Fall 18	Lab Work				
AT PSLO 10: Demonstrate an understanding of the evolving technology in the automotive control systems and the impact the automobile has on our environment.	Spring 19	Exam Questions				
AT PSLO 11: Demonstrate the ability to quickly master new techniques and skills as required in the automotive tune-up and diagnostic specialty.	Fall 19	Lab and Classroom Observation				
AT PSLO 12: Demonstrate an understanding of the science of the automotive engine	Spring 20	Exam Questions				
AT PSLO 13: Demonstrate the ability to work with a high degree of precision	Fall 14	Lab and Classroom Observation				
AT PSLO 14: Demonstrate an understanding of the science of the automotive drive train systems.	Spring 15	Exam Questions				
AT PSLO 15: Demonstrate the ability to use the latest techniques and tools used in servicing the automotive drive train.	Fall 15	Lab and Classroom Observation				
AT PSLO 16: Demonstrate an understanding of the evolving technology in the automotive control systems.	Spring 16	Exam Questions				

Attachment 2

COURSE REVIEW VERIFICATION

Discipline: Automotive Technology Year: 2015

Program/Discipline Automotive Technology

As part of the program evaluation process, the self-study team has reviewed the course outlines supporting the discipline/program curriculum. The review process has resulted in the following recommendations:

1. The following course outlines are satisfactory as written and do not require modification (list all such courses):
   AT 100, AT 133, AT 303, AT 306, AT 314, AT 324, AT 334, AT 336, AT 389

2. The following courses require minor modification to ensure currency. It is anticipated that such minor modifications will be completed by _____.

3. The following courses require major modification.
   AT 313, AT 323, AT 341, AT 343, AT 344, AT 379

   The self study team anticipates submitting such modifications to the AP&P committee, FALL 20 15 SPRING 20 16

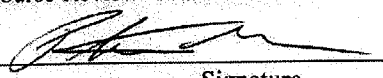
GENERAL EDUCATION or MULTICULTURAL/GENDER COURSES
The following courses were also reviewed as meeting an **AHC general education** requirement and were found to satisfactorily meet the established criteria (list courses by prefix & number):

The following courses were also reviewed as meeting an **AHC general education** requirement and will require modification to ensure the content reflects compliance with category definitions (list courses by prefix & number). It is anticipated that such modifications will be completed by:
(date) _____

The following courses were also reviewed as meeting the **multicultural/gender graduation** requirement and were found to satisfactorily meet the established criteria (list courses by prefix & number):

The following courses were also reviewed as meeting the **multicultural/general graduation requirement** and will require modification to ensure the content reflects compliance with category definitions (list courses by prefix & number). It is anticipated that such modifications will be completed by:
(date) _____

Course Review Team Members: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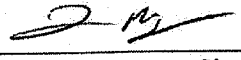
Signature Date


3-31-15

Signature Date

Signature Date

Signature Date


3-31-15

Signature Academic Dean Date

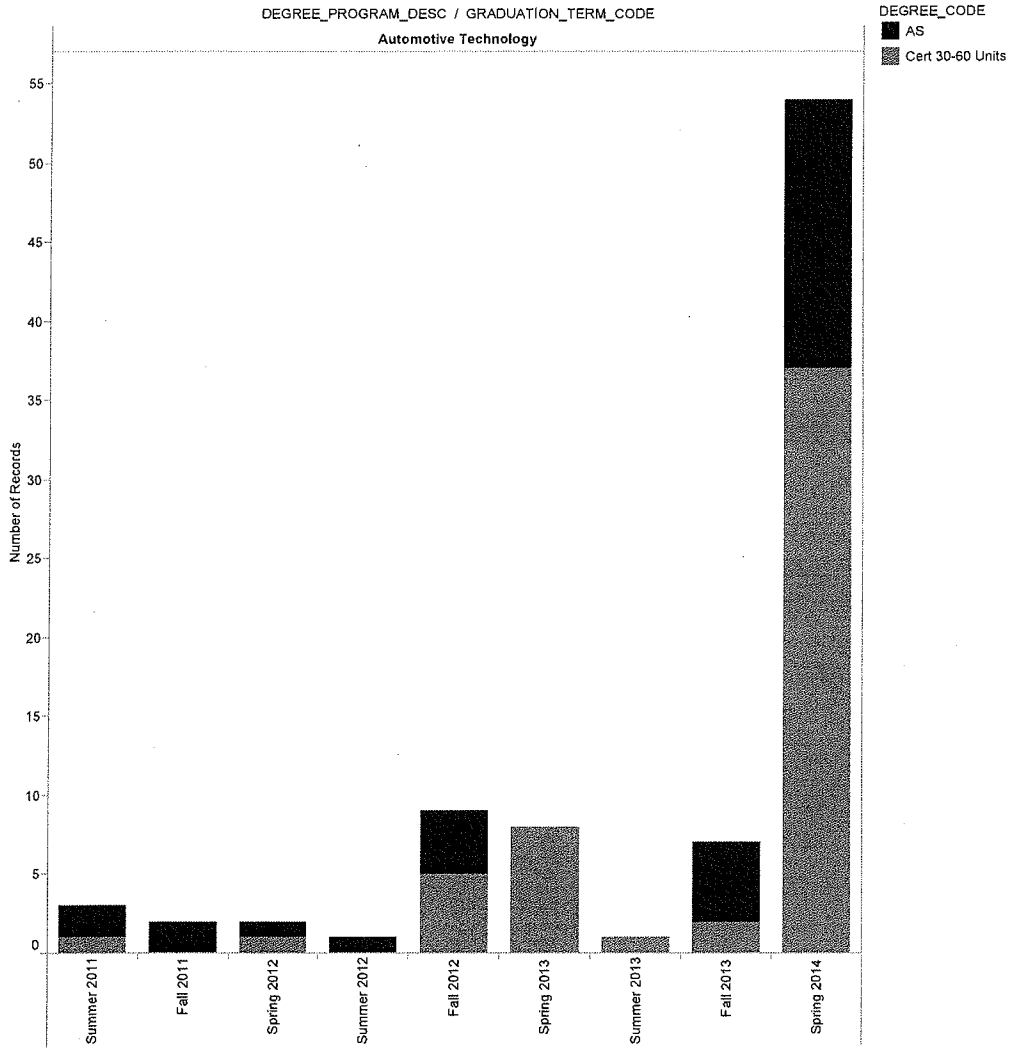
Automotive Technology
REVIEW OF PREREQUISITES, COREQUISITES, AND ADVISORIES

Course Prefix No	CURRENT	LEVEL OF SCRUTINY	RESULT	ACTION TO BE TAKEN (None, APP- Major or Minor)
AT 100	None	Statistics, Program Alignment		No change
AT 133 (333)	Pre: AT100 LOE: None Pre. Skills: None	Content Review, Program Alignment	LOE: "Must Take and Pass Safety Test" Pre. Skills: AT100 SLOs	Fall 2013 Major Mod.
AT 303	Pre: None	Content Review, Program Alignment	Pre: AT100 LOE: "Must Take and Pass Safety Test"	Fall 2013 Major Mod.
AT 306	Pre: AT100	Content Review, Program Alignment	Pre: AT100 LOE: "Must Take and Pass Safety Test" Adv: AT303	Fall 2013 Major Mod.
AT 313	Pre: AT100	Content Review, Program Alignment	Pre: AT100 LOE: "Must Take and Pass Safety Test" Adv: AT303	Major Mod. F15
AT 314	Pre: AT 100 LOE: "Must Take and Pass Safety Test" Pre. Skills: AT100 SLOs	Content Review, Program Alignment		No Change
AT 323	None	Content Review, Program Alignment	Pre: AT100 LOE: "Must Take and Pass Safety Test"	Major Mod. S16
AT 324	Pre: AT 100 LOE: "Must Take and Pass Safety Test" Pre. Skills: AT100 SLOs	Content Review, Program Alignment		No Change
AT 334	Pre: AT 100 and AT 133 (333)	Content Review, Program Alignment	Pre: AT 133, LOE: "Must Take and Pass Safety Test"	Fall 2013 Major Mod.
AT 336	Pre: AT 334	New Offering S15; no data		No Change
AT 341	Adv: AT 303	Content Review, Program Alignment	Pre: AT303 LOE: "Must Take and Pass Safety Test"	Major Mod. F15
AT 343	Adv. AT 341	Content Review, Program Alignment	Pre: AT341 LOE: "Must Take and Pass Safety Test"	Major Mod. F15
AT 344	Adv. AT 341 and AT 343	Content Review, Program Alignment	Pre: AT343 LOE: "Must Take and Pass Safety Test"	Major Mod. F15
AT 379 B	Adv. AT 343	Content Review, Program Alignment	Pre: AT343 LOE: "Must Take and Pass Safety Test"	Major Mod. S15
AT 389	None	Content Review, Program Alignment		No Change

Attachment 3

Degrees & Certificates

		GRADUATION_TERM_CODE									
DEGREE_PRO..	DEGREE_CODE	Summer 2011	Fall 2011	Spring 2012	Summer 2012	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014	Grand Total
Automotive Technology	AS	2	2	1	1	4			5	17	32
	Cert 30-60 Units	1		1		5	8	1	2	37	55
Grand Total		3	2	2	1	9	8	1	7	54	87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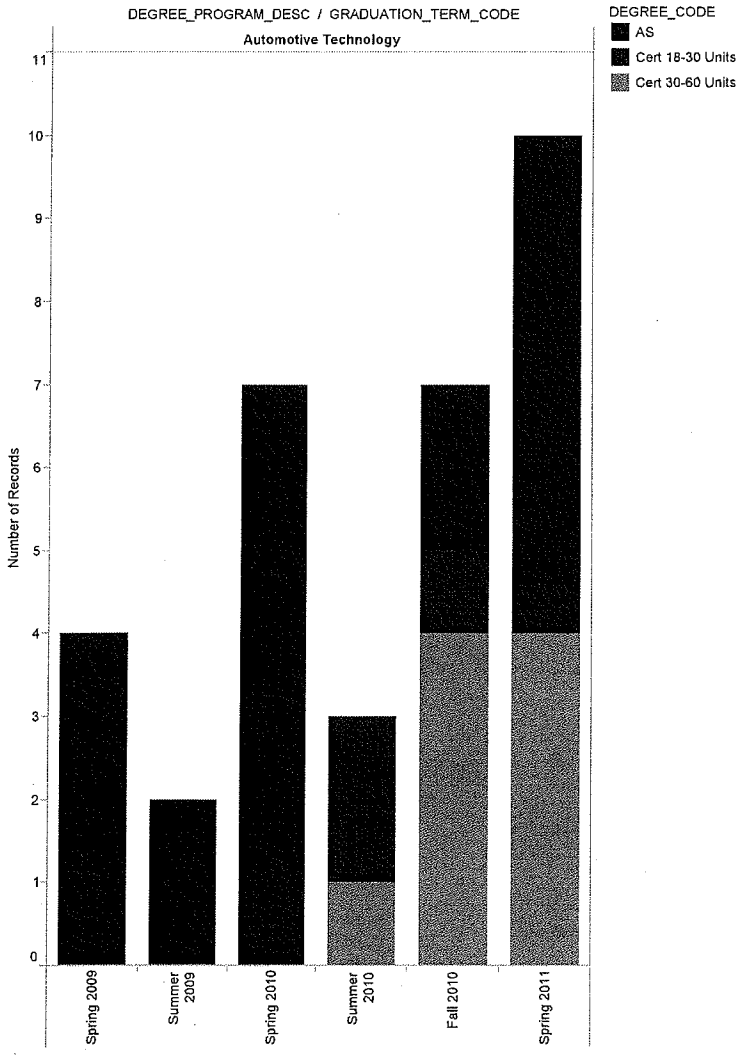
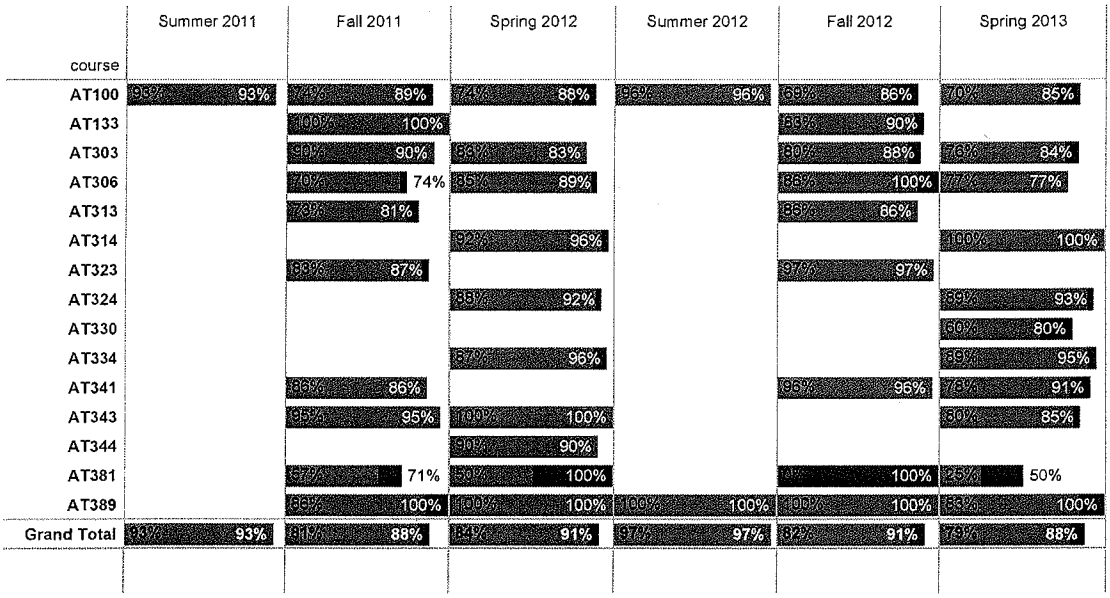
Automotive Technology
DEGREE_CODE
AS
Cert 30-60 Units
Number of Records
55
50
45
40
35
30
25
20
15
10
5
0
Summer 2011
Fall 2011
Spring 2012
Summer 2012
Fall 2012
Spring 2013
Summer 2013
Fall 2013
Spring 2014

Degrees & Certificates

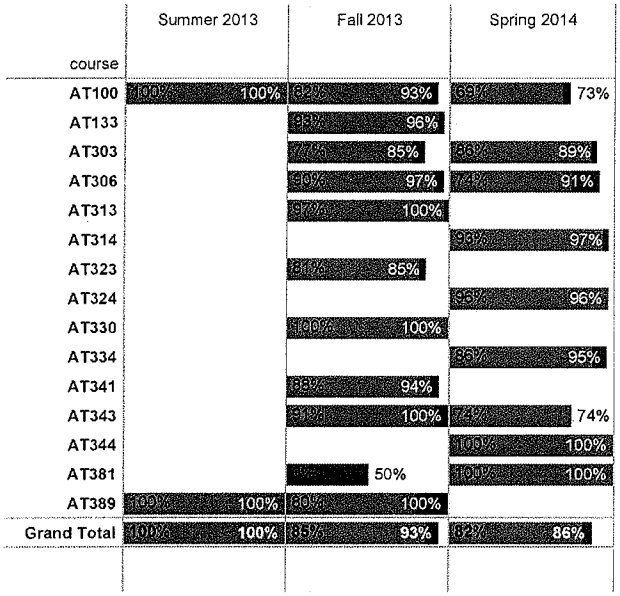
		GRADUATION_TERM_CODE						
DEGREE_PRO..	DEGREE_CODE	Spring 2009	Summer 2009	Spring 2010	Summer 2010	Fall 2010	Spring 2011	Grand Total
Automotive Technology	AS	4	2	7		2	6	21
	Cert 18-30 Units				2	1		3
	Cert 30-60 Units				1	4	4	9
Grand Total		4	2	7	3	7	10	33


DEGREE_PROGRAM_DESC / GRADUATION_TERM_CODE
Automotive Technology
DEGREE_CODE
AS
Cert 18-30 Units
Cert 30-60 Units
Number of Records
0
1
2
3
4
5
6
7
8
9
10
11
Spring 2009
Summer 2009
Spring 2010
Summer 2010
Fall 2010
Spring 2011

Summer 2011, Fall 2011, Spring 2012 and 6 more Retention & Success



Summer 2011, Fall 2011, Spring 2012 and 6 more Retention & Success



Measure Names

- Retention %
- Success %

Summer 2011, Fall 2011, Spring 2012 and 6 more Enrollment, FTES, Retention & Success AHC Data

	Summer 2011	Fall 2011	Spring 2012	Summer 2012	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014
Sections	314	1,023	1,146	293	1,004	1,087	285	1,069	1,141
Headcount	5,798	10,957	11,736	5,551	10,883	11,361	5,421	10,922	11,293
Enrollment	9,242	29,219	30,988	8,784	28,559	29,609	8,455	28,612	29,369
Retention %	85.50%	86.69%	84.65%	89.79%	86.62%	86.17%	89.13%	86.97%	85.23%
Success %	74.32%	68.63%	69.09%	77.33%	69.63%	70.38%	77.46%	70.56%	70.22%
FTES	1,072	3,881	3,854	1,001	3,745	3,776	978	3,813	3,824

Summer 2011, Fall 2011, Spring 2012 and 6 more AT Outcomes

	Summer 2011	Fall 2011	Spring 2012	Summer 2012	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014
Sections	1.0	13.0	13.0	2.0	12.0	14.0	2.0	14.0	12.0
Headcount	27.0	192.0	206.0	29.0	191.0	202.0	28.0	209.0	206.0
Enrollment	27.0	265.0	282.0	29.0	267.0	275.0	28.0	286.0	265.0
retained	25.0	233.0	256.0	28.0	242.0	241.0	28.0	267.0	228.0
Retention %	92.59%	87.92%	90.78%	96.55%	90.64%	87.64%	100.00%	93.36%	86.04%
success	25.0	215.0	236.0	28.0	219.0	216.0	28.0	244.0	216.0
Success %	92.59%	81.13%	83.69%	96.55%	82.02%	78.55%	100.00%	85.31%	81.51%
FTES	5.4	60.2	63.6	4.8	61.5	63.7	5.0	65.4	60.9

Primary Instructor Load by Subject by Course by Term

				Term Code			
Subj..	Subject ..	CRN	Primary Instru..	Fall 2009	Spring 2010	Fall 2010	Spring 2011
AT	AT100	20661	McGuire, P (	0.38		0.38	
		20662	Lawrence, P (	0.38		0.38	
		20663	Rosenthal, M S	0.38		0.38	
		21292	Bradbury, L M			0.38	
		40081	McGuire, P (		0.38		0.38
		40082	Rosenthal, M S		0.38		0.38
		41514	Lawrence, P (		0.38		0.38
	AT133	20671	McGuire, P (	0.55		0.55	
	AT303	20676	Domingos, R (	0.37		0.37	
		21293	Domingos, R (			0.37	
		40083	Domingos, R (		0.13		0.37
	AT306	20678	Rosenthal, M S	0.14		0.14	
		40497	Rosenthal, M S		0.09		0.14
	AT313	20683	McGuire, P (	0.38		0.38	
	AT314	40084	McGuire, P (		0.44		0.44
	AT323	20686	Blackketter, J L	0.55			
			Stephen, S (			0.55	
	AT324	40085	Blackketter, J L		0.55		
			Stephen, S (				0.55
	AT334	40499	McGuire, P (		0.55		0.55
	AT341	20703	Domingos, R (	0.49		0.49	
		42126	Domingos, R (				0.49
	AT343	20704	Domingos, R (	0.55			
		40501	Domingos, R (		0.2		0.55
	AT344	41549	Domingos, R (		0.38		
	AT379A	42428	Storey, J M				0.1
	AT381	41190	Mabry, R D		0.2		

Sum of Crn Load Assigned Instr broken down by Term Code vs. Subject Code, Subject Course #, CRN and Primary Instructor Name. The data is filtered on Campus Desc and Time Of Day Desc. The Campus Desc filter keeps 8 of 8 members. The Time Of Day Desc filter keeps Day, Evening, TBA and Weekend. The view is filtered on Term Code, Subject Code, Subject Course #, CRN, Primary Instructor Name and sum of Crn Load Assigned Instr. The Term Code filter keeps 6 of 20 members. The Subject Code filter keeps AT. The Subject Course # filter keeps 1,574 of 1,574 members. The CRN filter keeps 7,967 of 7,967 members. The Primary Instructor Name filter keeps 1,015 of 1,015 members. The sum of Crn Load Assigned Instr filter ranges from 0.0001 to 10.

Primary Instructor Load by Subject by Course by Term

			Term Code			
Subj..	Subject ..	CRN	Primary Instru..	Fall 2009	Spring 2010	Fall 2010	Spring 2011
Grand Total				4.17	3.68	4.37	4.33

Sum of Crn Load Assigned Instr broken down by Term Code vs. Subject Code, Subject Course #, CRN and Primary Instructor Name. The data is filtered on Campus Desc and Time Of Day Desc. The Campus Desc filter keeps 8 of 8 members. The Time Of Day Desc filter keeps Day, Evening, TBA and Weekend. The view is filtered on Term Code, Subject Code, Subject Course #, CRN, Primary Instructor Name and sum of Crn Load Assigned Instr. The Term Code filter keeps 6 of 20 members. The Subject Code filter keeps AT. The Subject Course # filter keeps 1,574 of 1,574 members. The CRN filter keeps 7,967 of 7,967 members. The Primary Instructor Name filter keeps 1,015 of 1,015 members. The sum of Crn Load Assigned Instr filter ranges from 0.0001 to 10.

Primary Instructor Load by Subject by Course by Term

				Term Code			
Subj..	Subject ..	CRN	Primary Instru..	Fall 2009	Spring 2010	Fall 2010	Spring 2011
AT	AT100	20661	McGuire, P (	0.38		0.38	
		20662	Lawrence, P (	0.38		0.38	
		20663	Rosenthal, M S	0.38		0.38	
		21292	Bradbury, L M			0.38	
		40081	McGuire, P (		0.38		0.38
		40082	Rosenthal, M S		0.38		0.38
		41514	Lawrence, P (		0.38		0.38
	AT133	20671	McGuire, P (	0.55		0.55	
	AT303	20676	Domingos, R (	0.37		0.37	
		21293	Domingos, R (			0.37	
		40083	Domingos, R (		0.13		0.37
	AT306	20678	Rosenthal, M S	0.14		0.14	
		40497	Rosenthal, M S		0.09		0.14
	AT313	20683	McGuire, P (	0.38		0.38	
	AT314	40084	McGuire, P (		0.44		0.44
	AT323	20686	Blackketter, J L	0.55			
			Stephen, S (			0.55	
	AT324	40085	Blackketter, J L		0.55		
			Stephen, S (				0.55
	AT334	40499	McGuire, P (		0.55		0.55
	AT341	20703	Domingos, R (	0.49		0.49	
		42126	Domingos, R (				0.49
	AT343	20704	Domingos, R (	0.55			
		40501	Domingos, R (		0.2		0.55
	AT344	41549	Domingos, R (		0.38		
	AT379A	42428	Storey, J M				0.1
	AT381	41190	Mabry, R D		0.2		

Sum of Crn Load Assigned Instr broken down by Term Code vs. Subject Code, Subject Course #, CRN and Primary Instructor Name. The data is filtered on Campus Desc and Time Of Day Desc. The Campus Desc filter keeps 8 of 8 members. The Time Of Day Desc filter keeps Day, Evening, TBA and Weekend. The view is filtered on Term Code, Subject Code, Subject Course #, CRN, Primary Instructor Name and sum of Crn Load Assigned Instr. The Term Code filter keeps 6 of 20 members. The Subject Code filter keeps AT. The Subject Course # filter keeps 1,574 of 1,574 members. The CRN filter keeps 7,967 of 7,967 members. The Primary Instructor Name filter keeps 1,015 of 1,015 members. The sum of Crn Load Assigned Instr filter ranges from 0.0001 to 10.

Primary Instructor Load by Subject by Course by Term

			Term Code			
Subj..	Subject .. CRN	Primary Instru..	Fall 2009	Spring 2010	Fall 2010	Spring 2011
Grand Total			4.17	3.68	4.37	4.33

Sum of Crn Load Assigned Instr broken down by Term Code vs. Subject Code, Subject Course #, CRN and Primary Instructor Name. The data is filtered on Campus Desc and Time Of Day Desc. The Campus Desc filter keeps 8 of 8 members. The Time Of Day Desc filter keeps Day, Evening, TBA and Weekend. The view is filtered on Term Code, Subject Code, Subject Course #, CRN, Primary Instructor Name and sum of Crn Load Assigned Instr. The Term Code filter keeps 6 of 20 members. The Subject Code filter keeps AT. The Subject Course # filter keeps 1,574 of 1,574 members. The CRN filter keeps 7,967 of 7,967 members. The Primary Instructor Name filter keeps 1,015 of 1,015 members. The sum of Crn Load Assigned Instr filter ranges from 0.0001 to 10.

Primary Instructor Load by Subject by Course by Term

				Term Code								
Subj..	Subject ..	CRN	Primary Instru..	Summer 2011	Fall 2011	Spring 2012	Summer 2012	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014
AT	AT100	10203	Rosenthal, M S							0.38		
		10978	Rosenthal, M S	0.38			0.38					
		20415	Foster, A (								0.38	
		20416	Rosenthal, M S								0.38	
		20439	Lawrence, P (					0.38				
		20440	Rosenthal, M S					0.38				
		20661	McGuire, P (		0.38							
		20662	Lawrence, P (		0.38							
		20663	Rosenthal, M S		0.38							
		20921	Bradbury, L M								0.38	
		21409	Bradbury, L M					0.38				
		21808	Mathiesen, P C								0.38	
		40042	Mathiesen, P C									0.38
		40043	Bradbury, L M									0.38
		40048	Mathiesen, P C						0.38			
		40049	Foster, A (						0.38			
		40081	McGuire, P (			0.38						
		40082	Rosenthal, M S			0.38						
		40651	Foster, A (									0.38
		40709	Lawrence, P (						0.38			
		40859	Rosenthal, M S									0.38
		41174	Rosenthal, M S						0.38			
		41514	Lawrence, P (			0.38						
		42962	Johnson, M (			0.38						
	AT133	20423	McGuire, P (								0.55	
		20447	McGuire, P (					0.55				
		20671	McGuire, P (		0.55							
	AT303	20425	McGuire, P (								0.37	
		20450	McGuire, P (					0.37				
		20676	Domingos, R (		0.37							
		21375	Stephen, S (					0.37				
		40044	McGuire, P (									0.37
		40050	McGuire, P (						0.37			
		40083	Domingos, R (			0.37						
	AT306	20427	Rosenthal, M S								0.14	

Sum of Crn Load Assigned Instr broken down by Term Code vs. Subject Code, Subject Course #, CRN and Primary Instructor Name. The data is filtered on Campus Desc and Time Of Day Desc. The Campus Desc filter keeps 8 of 8 members. The Time Of Day Desc filter keeps Day, Evening, TBA and Weekend. The view is filtered on Term Code, Subject Code, Subject Course #, CRN, Primary Instructor Name and sum of Crn Load Assigned Instr. The Term Code filter keeps 9 of 20 members. The Subject Code filter keeps AT. The Subject Course # filter keeps 1,574 of 1,574 members. The CRN filter keeps 7,967 of 7,967 members. The Primary Instructor Name filter keeps 1,015 of 1,015 members. The sum of Crn Load Assigned Instr filter ranges from 0.0001 to 10.

Primary Instructor Load by Subject by Course by Term

				Term Code									
Subj..	Subject ..	CRN	Primary Instru..	Summer 2011	Fall 2011	Spring 2012	Summer 2012	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014
AT	AT306	20452	Rosenthal, M S					0.14				
		20678	Rosenthal, M S		0.14							
		40300	Rosenthal, M S									0.14
		40319	Rosenthal, M S						0.14			
		40497	Rosenthal, M S			0.14						
	AT313	20431	McGuire, P (								0.38	
		20456	McGuire, P (					0.38				
		20683	McGuire, P (		0.38							
	AT314	40045	McGuire, P (									0.44
		40051	McGuire, P (						0.44			
		40084	McGuire, P (			0.44						
	AT323	20433	Blackketter, J L								0.55	
		20458	Blackketter, J L					0.55				
		20686	Bradbury, L M		0.55							
	AT324	40046	Whitacre, B S									0.55
		40052	Blackketter, J L						0.55			
		40085	Stephen, S (			0.55						
	AT334	40302	McGuire, P (									0.55
		40321	McGuire, P (						0.55			
		40499	McGuire, P (			0.55						
	AT341	20445	Domingos, R (								0.55	
		20473	Domingos, R (					0.55				
		20703	Domingos, R (		0.49							
		41782	Stephen, S (						0.55			
	AT343	21350	Stephen, S (								0.55	
		22298	Stephen, S (		0.55							
		40303	Domingos, R (									0.55
		40322	Domingos, R (						0.55			
		40501	Domingos, R (			0.55						
	AT344	41608	Leonard, R M									0.38
		43238	Domingos, R (			0.38						
	AT389	10780	McGuire, P (							0.03		
		21862	McGuire, P (					0.03				
		21975	McGuire, P (								0.02	
		42021	McGuire, P (						0.03			

Sum of Crn Load Assigned Instr broken down by Term Code vs. Subject Code, Subject Course #, CRN and Primary Instructor Name. The data is filtered on Campus Desc and Time Of Day Desc. The Campus Desc filter keeps 8 of 8 members. The Time Of Day Desc filter keeps Day, Evening, TBA and Weekend. The view is filtered on Term Code, Subject Code, Subject Course #, CRN, Primary Instructor Name and sum of Crn Load Assigned Instr. The Term Code filter keeps 9 of 20 members. The Subject Code filter keeps AT. The Subject Course # filter keeps 1,574 of 1,574 members. The CRN filter keeps 7,967 of 7,967 members. The Primary Instructor Name filter keeps 1,015 of 1,015 members. The sum of Crn Load Assigned Instr filter ranges from 0.0001 to 10.

Primary Instructor Load by Subject by Course by Term

				Term Code								
Subj..	Subject ..	CRN	Primary Instru..	Summer 2011	Fall 2011	Spring 2012	Summer 2012	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014
AT	AT389	43248	McGuire, P (			0.02						
Grand Total				0.38	4.17	4.52	0.38	4.08	4.70	0.41	4.63	4.50

Sum of Crn Load Assigned Instr broken down by Term Code vs. Subject Code, Subject Course #, CRN and Primary Instructor Name. The data is filtered on Campus Desc and Time Of Day Desc. The Campus Desc filter keeps 8 of 8 members. The Time Of Day Desc filter keeps Day, Evening, TBA and Weekend. The view is filtered on Term Code, Subject Code, Subject Course #, CRN, Primary Instructor Name and sum of Crn Load Assigned Instr. The Term Code filter keeps 9 of 20 members. The Subject Code filter keeps AT. The Subject Course # filter keeps 1,574 of 1,574 members. The CRN filter keeps 7,967 of 7,967 members. The Primary Instructor Name filter keeps 1,015 of 1,015 members. The sum of Crn Load Assigned Instr filter ranges from 0.0001 to 10.

	Fall 2008		Spring 2009		Fall 2009		Spring 2010		Fall 2010		Spring 2011	
age_category	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES
Under 19	71.00	19.83	65.00	16.54	77.00	20.33	64.00	17.94	76.00	21.86	59.00	15.76
20-24	45.00	14.38	49.00	15.23	69.00	21.77	78.00	23.96	87.00	26.79	82.00	24.07
25-29	15.00	5.46	18.00	6.26	13.00	5.04	10.00	3.14	25.00	8.25	24.00	7.91
30-34	5.00	1.17	8.00	2.72	5.00	1.73	5.00	1.94	5.00	1.76	14.00	3.27
35-39	6.00	1.68	5.00	1.23	3.00	1.27	4.00	0.95	5.00	1.57	6.00	1.44
40-49	7.00	1.55	7.00	2.37	4.00	1.13	17.00	4.29	4.00	1.66	11.00	2.49
50+	5.00	1.24	5.00	1.23	5.00	1.38	8.00	2.45	3.00	0.75	8.00	2.16

	Fall 2008		Spring 2009		Fall 2009		Spring 2010		Fall 2010		Spring 2011	
Enrollment Status	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES
First Time	42.0	11.2	17.0	5.0	39.0	11.1	25.0	6.8	100.0	29.3	30.0	6.6
First Time Transf..	1.0	0.5	3.0	0.7	11.0	3.6	9.0	3.3	10.0	4.0	5.0	1.2
Returning	37.0	9.6	23.0	7.3	38.0	10.6	39.0	9.2	18.0	4.9	8.0	1.4
Continuing	66.0	22.4	103.0	30.3	84.0	26.5	113.0	35.4	77.0	24.4	156.0	47.0
Unknown			1.0	0.3							2.0	0.3
N/A	8.0	1.7	10.0	2.0	4.0	0.8					3.0	0.6
Grand Total	154.0	45.3	157.0	45.6	176.0	52.7	186.0	54.7	205.0	62.6	204.0	57.1

	Summer 2011		Fall 2011		Spring 2012		Summer 2012		Fall 2012		Spring 2013		Summer 2013		Fall 2013		Spring 2
Enrollment Status	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..
First Time	9.0	1.8	30.0	7.7	16.0	3.8	12.0	2.4	32.0	7.9	27.0	7.6	11.0	2.3	57.0	14.5	23.0
First Time Transf..			3.0	1.0	7.0	2.1	2.0	0.4	2.0	0.4	13.0	3.0	1.0	0.2	5.0	1.1	4.0
Returning	10.0	2.0	30.0	8.3	16.0	3.6	8.0	1.4	46.0	12.6	14.0	3.6	6.0	1.3	14.0	4.2	30.0
Continuing	8.0	1.6	128.0	42.5	166.0	53.9	7.0	0.6	110.0	40.3	147.0	49.3	10.0	1.2	132.0	45.4	147.0
N/A					1.0	0.2			1.0	0.2	1.0	0.2			1.0	0.2	1.0
Grand Total	27.0	5.4	191.0	59.6	206.0	63.6	29.0	4.8	191.0	61.5	202.0	63.7	28.0	5.0	209.0	65.4	205.0

Enrollment Status	ing 2014 FTES
First Time	5.3
First Time Transf..	0.9
Returning	7.8
Continuing	46.6
N/A	0.2
Grand Total	60.8

	Summer 2011		Fall 2011		Spring 2012		Summer 2012		Fall 2012		Spring 2013		Summer 2013		Fall 2013		Spring 2
age_category	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..
Under 19	7.00	1.41	53.00	15.52	49.00	12.82	7.00	1.41	54.00	14.39	59.00	16.16	6.00	1.26	62.00	18.61	67.00
20-24	8.00	1.61	85.00	26.84	93.00	29.51	9.00	1.64	82.00	27.46	84.00	27.72	7.00	1.12	87.00	27.12	85.00
25-29	2.00	0.40	19.00	6.11	31.00	10.27	4.00	0.47	23.00	6.65	23.00	5.65	5.00	0.87	30.00	8.82	26.00
30-34	7.00	1.41	9.00	3.90	11.00	4.42	6.00	1.04	11.00	4.55	13.00	4.54	5.00	1.05	9.00	4.51	9.00
35-39			6.00	1.85	6.00	1.72			9.00	3.91	10.00	3.64	2.00	0.42	8.00	2.58	7.00
40-49	3.00	0.60	13.00	3.11	12.00	3.60	2.00	0.23	10.00	4.02	11.00	5.46	2.00	0.06	8.00	2.86	7.00
50+			6.00	2.24	4.00	1.22	1.00	0.03	2.00	0.53	2.00	0.50	1.00	0.21	5.00	0.89	4.00

age_category	ing 2014 FTES
Under 19	18.02
20-24	24.93
25-29	7.77
30-34	4.08
35-39	2.71
40-49	2.19
50+	1.14

	Fall 2008		Spring 2009		Fall 2009		Spring 2010		Fall 2010		Spring 2011	
ETHNICITY	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES
Asian	9.0	3.2	5.0	1.9	4.0	1.3	7.0	2.2	10.0	2.7	6.0	2.2
Black	2.0	0.4	4.0	1.2	2.0	0.8	3.0	1.1	4.0	1.5	3.0	0.6
Filipino	2.0	0.5			2.0	0.6	4.0	1.3	6.0	3.2	5.0	1.7
Hispanic	85.0	25.2	81.0	23.1	98.0	28.0	89.0	26.1	118.0	33.4	119.0	34.7
Native American	2.0	0.5	3.0	1.1	1.0	0.2	3.0	0.8	1.0	0.2	4.0	1.0
Other	1.0	0.2	3.0	0.7	1.0	0.6						
Pacific Islander	1.0	0.4	1.0	0.6	2.0	0.6	3.0	0.7	2.0	0.7	1.0	0.6
Unknown	5.0	1.6	9.0	2.9	3.0	0.9	3.0	0.6	1.0	0.0	2.0	0.3
White	47.0	13.3	51.0	14.1	63.0	19.8	74.0	21.9	63.0	20.7	64.0	16.1

	Fall 2008		Spring 2009		Fall 2009		Spring 2010		Fall 2010		Spring 2011	
Gender	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES
Female	9.0	2.7	17.0	4.1	8.0	2.4	10.0	3.1	13.0	4.0	10.0	3.0
Male	145.0	42.6	140.0	41.4	166.0	49.6	176.0	51.5	192.0	58.6	194.0	54.1
Unknown					2.0	0.6						
Grand Total	154.0	45.3	157.0	45.6	176.0	52.7	186.0	54.7	205.0	62.6	204.0	57.1

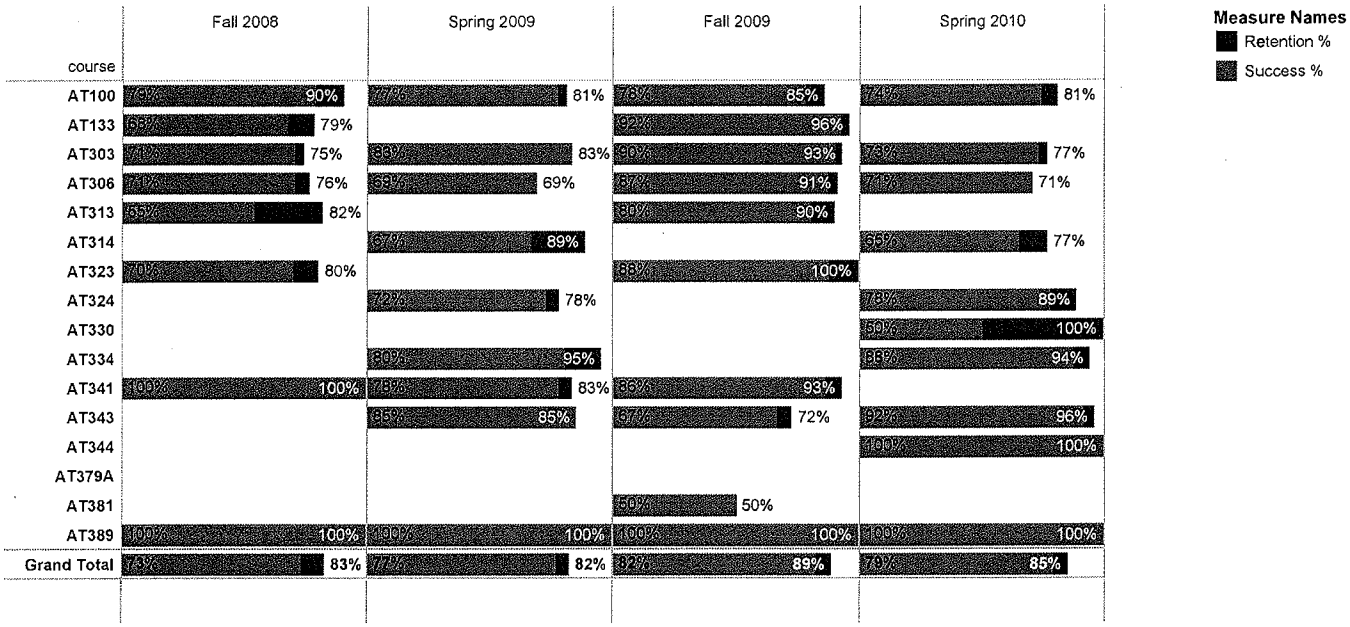
	Summer 2011		Fall 2011		Spring 2012		Summer 2012		Fall 2012		Spring 2013		Summer 2013		Fall 2013		Spring 2
ETHNICITY	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..
Asian	1.0	0.2	6.0	2.4	4.0	2.2	2.0	0.2	6.0	1.5	4.0	1.0			2.0	0.5	4.0
Black			3.0	0.8	4.0	1.1	1.0	0.2	2.0	0.4	2.0	0.4			1.0	0.2	5.0
Filipino	1.0	0.2	4.0	1.6	3.0	1.2	1.0	0.2	5.0	1.8	5.0	1.4	1.0	0.2	7.0	2.6	4.0
Hispanic	13.0	2.6	122.0	38.9	144.0	44.6	17.0	3.1	123.0	40.2	121.0	39.3	18.0	3.4	149.0	47.2	130.0
Native American			3.0	1.1	2.0	0.4	1.0	0.2	5.0	1.6	6.0	2.1			5.0	2.3	6.0
Pacific Islander			1.0	0.2							1.0	0.2					3.0
White	12.0	2.4	52.0	14.5	49.0	14.0	7.0	0.9	50.0	16.0	63.0	19.2	9.0	1.4	45.0	12.5	53.0

ETHNICITY	ing 2014 FTES
Asian	1.0
Black	1.2
Filipino	1.4
Hispanic	39.9
Native American	1.9
Pacific Islander	0.6
White	14.8

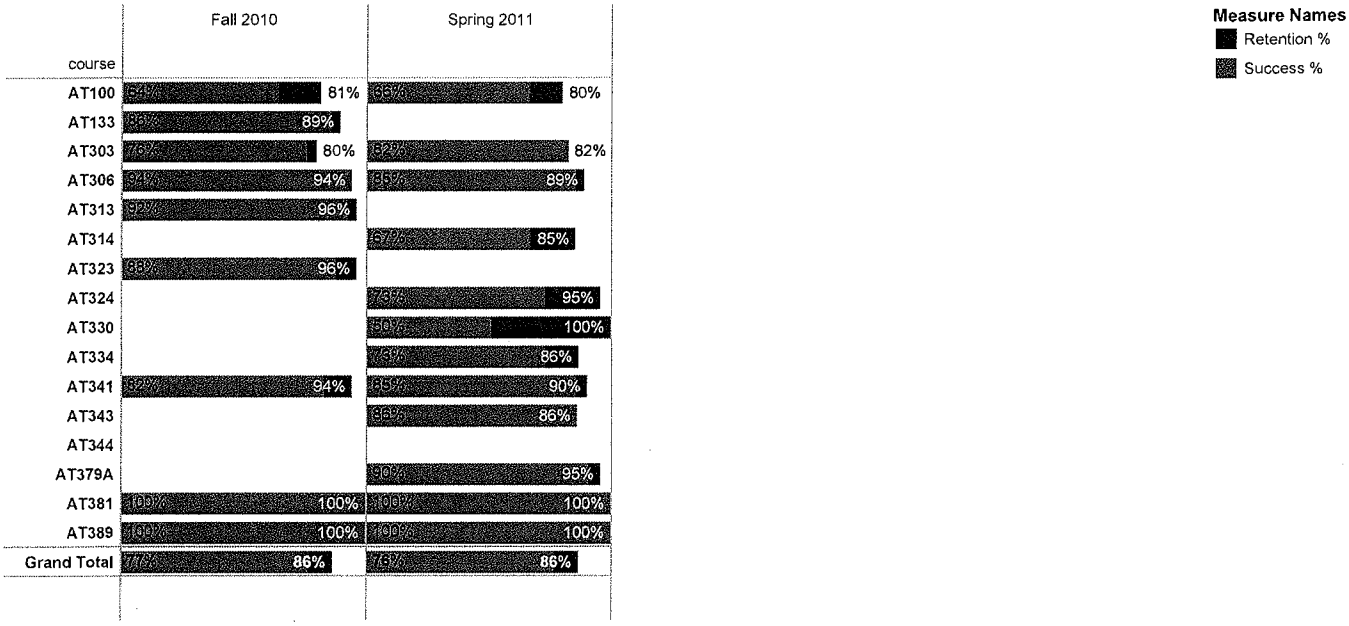
	Summer 2011		Fall 2011		Spring 2012		Summer 2012		Fall 2012		Spring 2013		Summer 2013		Fall 2013		Spring 2
Gender	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..	FTES	Headc..
Female	2.0	0.4	8.0	1.6	12.0	3.0			8.0	1.8	11.0	2.7	2.0	0.4	18.0	4.3	14.0
Male	24.0	4.8	182.0	57.6	194.0	60.6	28.0	4.6	182.0	59.5	191.0	61.0	26.0	4.6	191.0	61.1	191.0
Unknown	1.0	0.2	1.0	0.4			1.0	0.2	1.0	0.2							
Grand Total	27.0	5.4	191.0	59.6	206.0	63.6	29.0	4.8	191.0	61.5	202.0	63.7	28.0	5.0	209.0	65.4	205.0

	ing 2014
Gender	FTES
Female	3.0
Male	57.8
Unknown	
Grand Total	60.8

Fall 2008, Spring 2009, Fall 2009 and 3 more Retention & Success



Fall 2008, Spring 2009, Fall 2009 and 3 more Retention & Success



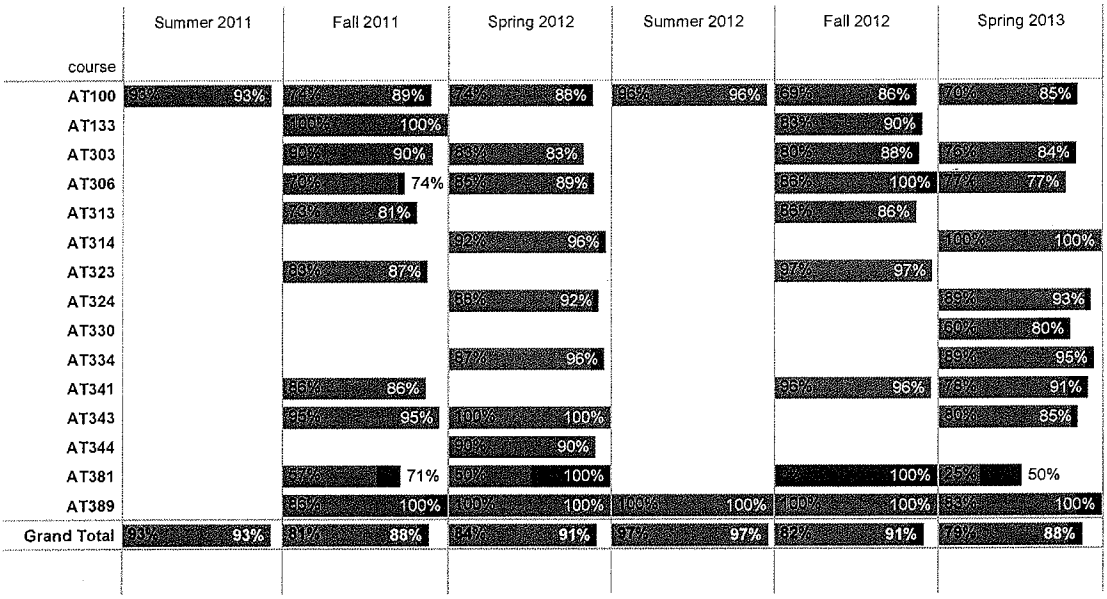
Summer 2008, Fall 2008, Spring 2009 and 6 more Enrollment, FTES, Retention & Success AHC Data

	Summer 2008	Fall 2008	Spring 2009	Summer 2009	Fall 2009	Spring 2010	Summer 2010	Fall 2010	Spring 2011
Sections	415	1,274	1,201	262	1,114	1,238	348	1,178	1,240
Headcount	5,746	11,690	12,098	4,637	11,253	12,728	6,230	12,131	12,689
Enrollment	9,071	30,223	30,506	7,161	29,913	32,406	10,179	32,211	33,109
Retention %	92.66%	88.36%	86.84%	88.58%	87.98%	88.82%	84.71%	85.14%	84.72%
Success %	77.71%	69.66%	70.25%	77.55%	68.49%	72.75%	72.20%	67.32%	68.82%
FTES	1,013	4,462	5,149	940	4,019	4,688	1,249	4,221	4,132

Fall 2008, Spring 2009, Fall 2009 and 3 more AT Outcomes

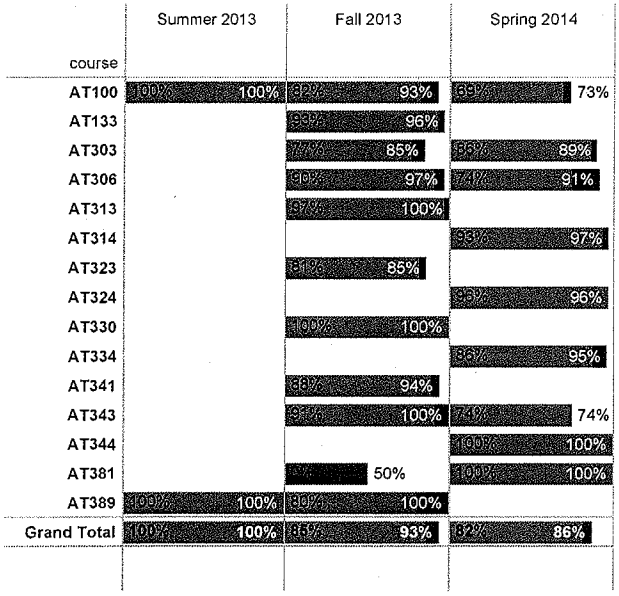
	Fall 2008	Spring 2009	Fall 2009	Spring 2010	Fall 2010	Spring 2011
Sections	11.0	10.0	12.0	12.0	13.0	14.0
Headcount	155.0	157.0	176.0	186.0	206.0	205.0
Enrollment	208.0	205.0	241.0	244.0	277.0	273.0
retained	172.0	168.0	214.0	208.0	239.0	236.0
Retention %	82.69%	81.95%	88.80%	85.25%	86.28%	86.45%
success	152.0	157.0	198.0	193.0	212.0	207.0
Success %	73.08%	76.59%	82.16%	79.10%	76.53%	75.82%
FTES	45.5	45.6	52.7	54.7	62.9	57.3

Summer 2011, Fall 2011, Spring 2012 and 6 more Retention & Success



Measure Names
- Retention %
- Success %

Summer 2011, Fall 2011, Spring 2012 and 6 more Retention & Success



Measure Names

- Retention %
- Success %

Summer 2011, Fall 2011, Spring 2012 and 6 more Enrollment, FTES, Retention & Success AHC Data

	Summer 2011	Fall 2011	Spring 2012	Summer 2012	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014
Sections	314	1,023	1,146	293	1,004	1,087	285	1,069	1,141
Headcount	5,798	10,957	11,736	5,551	10,883	11,361	5,421	10,922	11,293
Enrollment	9,242	29,219	30,988	8,784	28,559	29,609	8,455	28,612	29,369
Retention %	85.50%	86.69%	84.65%	89.79%	86.62%	86.17%	89.13%	86.97%	85.23%
Success %	74.32%	68.63%	69.09%	77.33%	69.63%	70.38%	77.46%	70.56%	70.22%
FTES	1,072	3,881	3,854	1,001	3,745	3,776	978	3,813	3,824

Summer 2011, Fall 2011, Spring 2012 and 6 more AT Outcomes

	Summer 2011	Fall 2011	Spring 2012	Summer 2012	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014
Sections	1.0	13.0	13.0	2.0	12.0	14.0	2.0	14.0	12.0
Headcount	27.0	192.0	206.0	29.0	191.0	202.0	28.0	209.0	206.0
Enrollment	27.0	265.0	282.0	29.0	267.0	275.0	28.0	286.0	265.0
retained	25.0	233.0	256.0	28.0	242.0	241.0	28.0	267.0	228.0
Retention %	92.59%	87.92%	90.78%	96.55%	90.64%	87.64%	100.00%	93.36%	86.04%
success	25.0	215.0	236.0	28.0	219.0	216.0	28.0	244.0	216.0
Success %	92.59%	81.13%	83.69%	96.55%	82.02%	78.55%	100.00%	85.31%	81.51%
FTES	5.4	60.2	63.6	4.8	61.5	63.7	5.0	65.4	60.9

Attachment 4

Employment Outcomes and Projections

Even though our stated purpose of the Automotive Technology program is employment, this is a very difficult area to measure or to make projections in. Many metrics exist but most are flawed and none measure our students directly.
The question is: Are we matching our output of students to the demand created by job openings in our service area?
Intuitively we know that most of our students gain employment as a result of their studies but this section of our Program Review seeks to verify and quantify this.

Program Output

Many students complete the program in the traditional manner being granted a degree or certificate. These numbers are carefully measured and tracked.

Year	Total AS and Cert. Awards in A.T. by AHC	A.H.C. A.T. FTES
2009-2010	10	106.58
2010-2011	20	119.19
2011-2012	7	127.86
2012-2013	18	128.33
2013-2014	61	130.56

CCCCO Data Mart

(The large increase in 13-14 was the product of an aggressive campaign by Counselor David Hernandez to encourage a large number of past students to either complete the few classes they needed in order to fulfill the graduation requirements or simply petition for the award.)

The 5-year average is 23.2 per year. If we assume that ½ of our students "cycle out" every year and our 5-year average FTES is 122.5 students then on average over the last 5 years 38% of our students are traditional "completers" (23.2 awards/61 students). In comparison, AHC Vocational Programs with between 75 and 150 FTES and meaningful data for the last 5 years the average is 34% and the statewide average for Automotive Technology for credit awards of 30 units or greater is 17%. By these measures the Auto Tech program at AHC is above average in productivity.

AHC Vocational Programs 75-150 FTES with data	09-14 Avg. FTES	09-14 Avg. Awards	Avg. Awards /FTES*.5
Accounting-050200	91.6	22.2	48%
Administration of Justice-210500	101.9	35.2	69%
Automotive Technology-094800	122.5	23.2	38%

Business and Commerce, General-050100	156.1	3.0	4%
Child Development/Early Care and Education-130500	153.0	20.6	27%
Computer Information Systems-070200	75.5	1.4	4%
Dance-100800	129.4	3.0	5%
Dramatic Arts-100700	114.0	23.4	41%
Film Production-061220	129.0	3.2	5%
Human Services-210400	99.3	30.2	61%
Licensed Vocational Nursing-123020	112.2	48.4	86%
Office Technology/Office Computer Applications-051400	85.1	18.0	42%
Technical Theater-100600	169.4	6.6	8%
AHC Average	118.4	18.3	34%
Statewide Auto Tech Credit Awards 30+ units	10030	839.4	16.7%

CCCCO Data Mart

So what about the 62% students who do not "complete"? Currently the only data being collected is the Statewide CTE Employment Outcomes Survey. The 2014 results show that those who do not complete stopped taking classes because "My goals were met ". Those goals did not include our degree or certificate. (http://cteos.santarosa.edu)

These students, the so-called "Skill-builders", are typically students already employed seeking certification (ASE), licenses (BAR) or are simply updating their skills. They are usually successful in school (98%) and earn better grades than their classmates (78% have a 3.0 or better). The results of their experience are typically positive with a 22% wage gain 1.5 years after completing courses. (http://cteos.santarosa.edu/sites/cteos.santarosa.edu/files/NCWE%20Skills-builder%20Presentation%20October%202013.pdf).

From our Program Review Student Survey we see that 29% of our students are already employed in the industry and some large portion of these probably fall into this category. But again there is no formal way to measure or track the gains these students see from taking courses in our program although current statewide initiatives are underway (http://doingwhatmatters.cccco.edu/ForCollegeLeadership/InformingPolicy.aspx).

Job Openings For Our Students

Labor market information is abundant but also suffers from some serious flaws, the major one being that the there is really only one "data well" and everyone drinks from it although they seem to draw drastically different conclusions.

Period	Area	Estimated Employment, Auto Techs	Projected	Number New Openings	Growth Percent	Net Replacement Needs	Annual Avg. Openings
2012 - 2022	Santa Barbara County	790	890	100	12.7	200	30

http://www.labormarketinfo.edd.ca.gov/cgi/databrowsing/occExplorerQSDetails.asp

	Santa Barbara-Santa Maria,	Employment Automotive Technicians	Employment per thousand jobs
	2013	670	3.855

http://www.bls.gov/oes/current/oes_42060.htm

Current employment in the trade in our area (Santa Barbara County) is gathered through the Bureau of Labor Statistics (BLS) Current Employment Statistics, Current Population Survey (CPS) and California Employment Development Department (EDD) data. Employment projections are made using this data by BLS and EDD Labor Market Information Division.

Errors in sampling, volatility in the overall economy, "lag" in data gathering and underreporting are often blamed for the seemingly wide range of estimates of current and projected job openings in the trade in our area.

Year	Est. BLS Employment	LMI Estimates	% Difference
2009	550	645*	15%
2010	490	620	21%
2011	520		26%
2012	590	790	25%
2013	670	NA	

*Averaged from 2 year projections

More striking is the apparent error in the LMI projections of job growth. These projections include new positions and net replacements. The current projection is for 30 openings (new and replacement) per year for all of Santa Barbara County. The questionable accuracy of this prediction is evident when we look at job postings for Auto Tech and related openings for the period of February 15th to March 15th. During this period there were 21 openings posted on Craig's List in Santa Maria and 18 different openings posted in Santa Barbara. Unless most of these 39 positions take more than a year to fill or never fill, the projections are obviously flawed.

Employment of Automotive Technicians in Santa Barbara County has been about 3.5 jobs per 1000 jobs or about .35%. Since this is primarily a service sector job with little differences between geographical areas this may be a better predictor of openings. Luckily LMI collects data for sub-county areas, which allow for the more realistic estimation of the labor force in the area from 5 cities to Buellton. And although the LMI predicts occupational growth of rate of 13% for A.T. in this area, historically their predictions have been inaccurate. A better approach would to assume no growth from new positions and only look at replacement rates due to retirements, etc. This replacement rate number is about 7%.

Area 2013	Total Workforce	Est. Jobs @ 3.5/1000	Annual Job Growth @ 7%
Arroyo Grande city	9,100	32	2
Buellton city	3,000	11	1
Grover Beach city	6,900	24	2
Guadalupe city	3,100	11	1
Lompoc city	16,800	59	4
Los Alamos CDP	700	2	0
Nipomo CDP	8,800	31	2
Oceano CDP	3,400	12	1
Orcutt CDP	13,400	47	3
Pismo Beach city	3,900	14	1
Santa Maria city	44,700	156	11
Santa Ynez CDP	2,600	9	1
Solvang city	2,600	9	1
Vandenberg AFB CDP	900	3	0
Vandenberg Village CDP	2,900	10	1
Total	122,800	430	30

So even thought total occupational employment number is different, using the method above the estimate for job openings is identical.

Matching Program Output to Job Openings

Using the rather complex method of index of dissimilarity as outlined in the paper "Are Career And Technical Education Programs At California Community Colleges Aligned With Local Labor Markets?" by Eric Chisholm there is less than 1% difference between awards and jobs. For the all AHC CTE programs there was a difference of 57.8%. This means that about 58% of the AHC CTE awards in 2012 do not match the available jobs. Across the state the average for the occupational classification of Installation, Maintenance and Repair is 12.2% (http://www.csus.edu/ppa/thesis-project/bank/2012/Chisholm.pdf). By this measure we are doing an excellent job of supplying the quantity of people to fill the available jobs.

One more note about labor data and projections. Recently the CCCCO began "Launch Board" as a clearinghouse for information. The only available data was for 2012-13 and although some information was useful, the employment data was not. It appears they purchased the employment data from EMSI and that it included multiple counties and metropolitan areas, including Ventura, into our area leading to a wildly exaggerated estimate of annual job openings (150). Other data errors lead me to believe that "Launch Board" should not be used as a data source in program review.

Conclusion

The available data does not answer specific questions regarding how our students do in the job market and so we are forced to make generalized conclusions. Given that, the data we do have indicates that our students have a very good chance of finding employment in the local area in the Automotive Technology field.

The obvious follow-on question is: Is the quality of our students a good match to the available jobs? This will have to be answered in another part of this review.

Attachemnt 5

College	Programs	Current Year
Allan Hancock	Automotive Technology (094800)	2012-2013

Enrollments				
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Distinct students Explain Methodology	285	314	10 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Full time equivalent students (FTES) - Credit Explain Methodology	105	128	22 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Full time equivalent students (FTES) - Noncredit Explain Methodology | Explain Missing Data				
Capacity				
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Number of sections offered Explain Methodology	0	25	100 %	
Support				
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Received financial aid - BOG waiver Explain Methodology	54 %	71 %	17 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Received financial aid - Pell grant Explain Methodology	21 %	35 %	15 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Received any other financial aid Explain Methodology	9 %	15 %	6 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Participated in DSPS Explain Methodology	3 %	3 %	0 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Participated in EOPS Explain Methodology	8 %	9 %	1 %	
CTE Program Persistence				
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Took an intro-level course in the program Explain Methodology | Explain Missing Data				
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Enrolled in a higher level CTE course in the same program within a year Explain Methodology | Explain Missing Data				
	5 Year Average	Current Metric	% Increase / Decrease	Trend

	5 Year Average	Current Metric	% Increase / Decrease	Trend
Continued in another CTE program within a year Explain Methodology | Explain Missing Data				
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Continued in a non-CTE program within a year Explain Methodology | Explain Missing Data				

Milestones

	5 Year Average	Current Metric	% Increase / Decrease	Trend
Course completion rate Explain Methodology	86 %	90 %	4 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Course success rate Explain Methodology	78 %	82 %	4 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Term to term retention Explain Methodology	45 %	44 %	-1 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
GPA Explain Methodology	2.94	2.90	-4 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Attained more than 8 higher-level CTE units Explain Methodology	20 %	23 %	3 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Took a basic skills course Explain Methodology	52 %	54 %	2 %	

Alignment

	5 Year Average	Current Metric	% Increase / Decrease	Trend
Transitioned from the same or similar CTE pathway in high school Explain Methodology	14 %	23 %	9 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Transferred to a four-year university in the same or similar CTE pathway Explain Methodology | Explain Missing Data				

Credentials

	5 Year Average	Current Metric	% Increase / Decrease	Trend
Locally issued certificates Explain Methodology | Explain Missing Data				
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Noncredit certificates Explain Methodology | Explain Missing Data				
	5 Year Average	Current Metric	% Increase / Decrease	Trend
Chancellor's office approved certificates Explain Methodology	*	13	282 %	
	5 Year Average	Current Metric	% Increase / Decrease	Trend

	5 Year Average	Current Metric	% Increase / Decrease	Trend
Associate's degrees Explain Methodology	*	*	-17 %	

	5 Year Average	Current Metric	% Increase / Decrease	Trend
External credentials Explain Methodology | Explain Missing Data				

Employment

	Previous Average	Current Metric	% Increase / Decrease	Trend
Employment (EDD) Explain Methodology | Explain Missing Data				

	5 Year Average	Current Metric	% Increase / Decrease	Trend
Employment retention (EDD) Explain Methodology | Explain Missing Data				

	Previous Average	Current Metric	% Increase / Decrease	Trend
Employed in the same or similiar field (CTE Employment Outcomes Survey) Explain Methodology | Explain Missing Data				

	Previous Average	Current Metric	% Increase / Decrease	Trend
Wage gain in field (CTE Employment Outcomes Survey) Explain Methodology | Explain Missing Data				

	2 Years Before	2 Years After	5 Years After
Statewide median annual salary for degree holders (Salary Surfer) Explain Methodology	Click Here To Collapse		
Programs (Salary Surfer)	**2 Years Before**	**2 Years After**	**5 Years After**
Auto Engine Rebuilding (094800)	$12,746	$35,675	$41,023
Auto Service Management (094800)	$12,746	$35,675	$41,023
Auto Tune-Up & Diagnostic Procedures (094800)	$12,746	$35,675	$41,023
Automotive Chassis (094800)	$12,746	$35,675	$41,023

	2 Years Before	2 Years After	5 Years After
Statewide median annual salary for certificate holders (Salary Surfer) Explain Methodology	Click Here To Collapse		
Programs (Salary Surfer)	**2 Years Before**	**2 Years After**	**5 Years After**
High-Tech Gen. Mechanic: Engine, Power Trains Specialist (094800)	$14,133	$29,535	$35,756
High-Tech Gen. Mechanic: Tune-Up Emission Control Specialist (094800)	$14,133	$29,535	$35,756

Regional Labor Market Information

	5 Years Ago	Current Metric	% Inc. / Dec.	Trend
Total people employed (EMSI) Explain Methodology	Click Here To Collapse			
Occupation	**5 Years Ago**	**Current Metric**	**% Inc. / Dec.**	**Trend**
Automotive Service Technicians and Mechanics (49-3023)	4,706	4,441	-5.6 %	
	54	50	-7.8 %	

	5 Years Ago	Current Metric	% Inc. / Dec.	Trend
Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093)				
Electronic Equipment Installers and Repairers, Motor Vehicles (49-2096)	63	49	-21.1 %	
Motorboat Mechanics and Service Technicians (49-3051)	80	70	-13.0 %	
Outdoor Power Equipment and Other Small Engine Mechanics (49-3053)	113	108	-4.8 %	
Recreational Vehicle Service Technicians (49-3092)	91	80	-12.7 %	

Projected job openings (EMSI)

Explain Methodology

Click Here To Collapse

Occupation	2012-17 Openings	2012-17 Avg. Annual Openings
Automotive Service Technicians and Mechanics (49-3023)	745	149
Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093)	8	2
Electronic Equipment Installers and Repairers, Motor Vehicles (49-2096)	7	1
Motorboat Mechanics and Service Technicians (49-3051)	18	4
Outdoor Power Equipment and Other Small Engine Mechanics (49-3053)	32	6
Recreational Vehicle Service Technicians (49-3092)	29	6

Median annual salary (EMSI)

Explain Methodology

Click Here To Collapse

Occupation	Entry level salary	Median salary
Automotive Service Technicians and Mechanics (49-3023)	$21,840	$36,608
Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093)	$40,560	$56,160
Electronic Equipment Installers and Repairers, Motor Vehicles (49-2096)	$21,424	$35,568
Motorboat Mechanics and Service Technicians (49-3051)	$26,832	$35,568
Outdoor Power Equipment and Other Small Engine Mechanics (49-3053)	$23,296	$34,112
Recreational Vehicle Service Technicians (49-3092)	$27,248	$42,016

Attachment 6

Plan for Workforce Development

The AHC Automotive Technology Program strives to serve area employers in several ways:

1. Informal relationships between employers and the program (instructors, classified staff).
2. Formal relationships through the Advisory Committee.
3. Providing required training for certification for those currently employed (Clean Air Car Course and Update Course).
4. Provide a location and staffing for professional certification testing (ASE).

These efforts result in connections between employers and students but only in a somewhat haphazard way. The employers often hire our students with little or no input from the program resulting in a mismatch between the employer needs and the students' abilities.

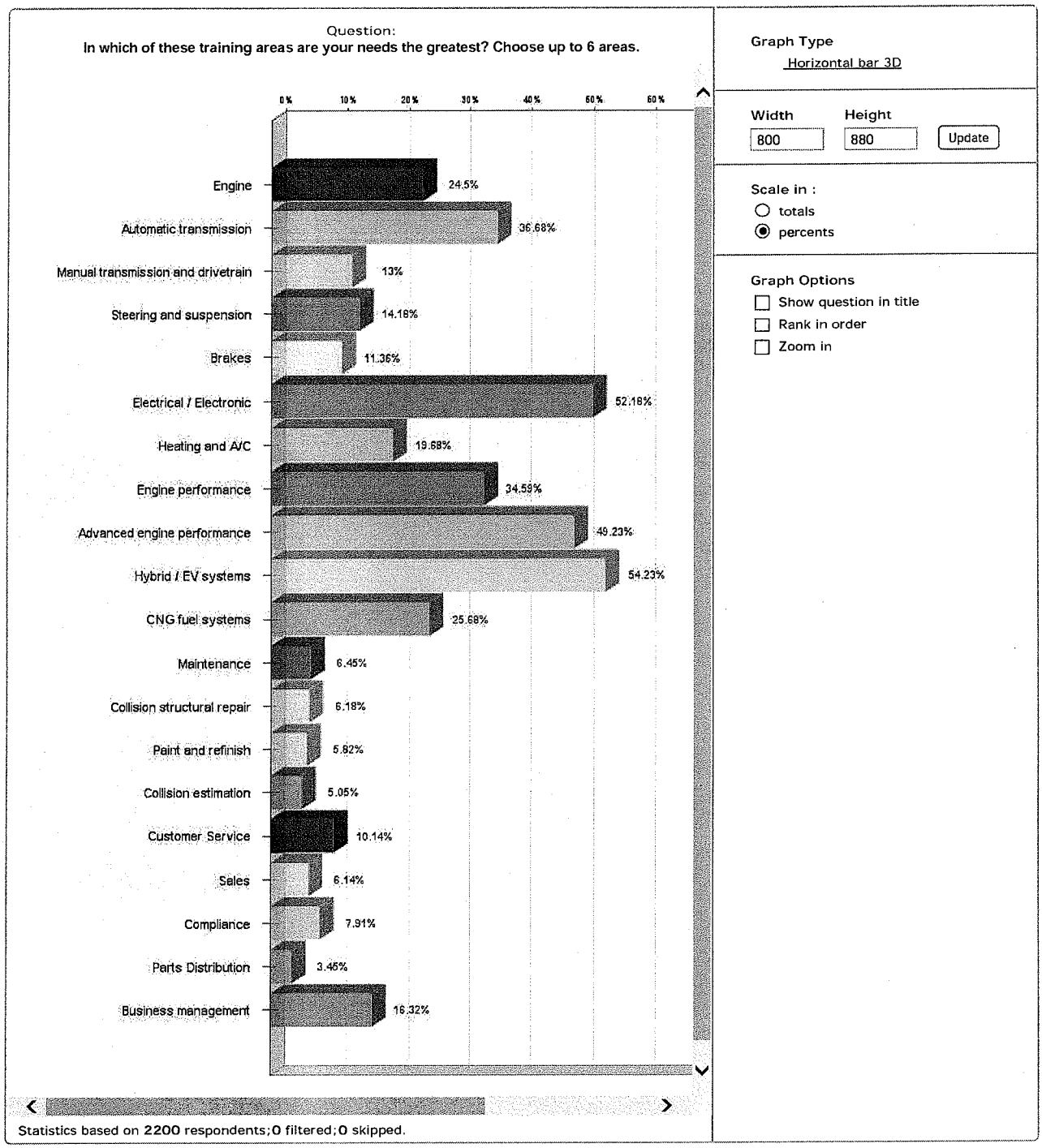
Efforts to improve the matching of students to employment opportunities have included Career Work Experience internships, having employers post openings on the AHC Career Job Placement Center web site and having students place their resumes on that site. Problems with this approach have been that students are reluctant to enter the workforce, are not available for any work or don't see any benefit to enrolling in CWE (it is currently not a requirement for a degree or certificate). The issue with the job openings has been that many employers are seeking full time employees who have completed training.

For full time seeking to fill positions and for students who have completed training, the students and employers should be encouraged to use the CJPC.

For students currently enrolled the program should coordinate internships. We would be able to maintain a list of current and past students with their grades in each course, their work experience, their professional certifications and licenses, their availability (looking for work, hours available). We could then screen these students and either forward a list of candidates to potential employers or simply have the students show up for interviews.

In addition the course CWE149 should be a required class in the program. This will require a change to the degrees and certificates. Until that is done CWE149 should be able to be substituted for AT 389 (Special Problems).

Attachment 7



Attachment 8

Auto Tech Advisory Committee Meeting Minutes
Allan Hancock College, Wednesday, November 20, 2013

In attendance: Pat Nicoll, Chairperson; Ron Domingos, Andy Motter, Mark Rosenthal, Per "Mat" Mathiesen, Art Foster, Loren Bradbury, Tim Muscio, Patrick McGuire, Nancy Miller, Richard Leonard, and Marna Lombardi

Agenda and Discussion Items:
Introduction of Advisory Committee members and Guests:
Pat Nicoll, Chair of the Auto Tech Advisory Committee, called the meeting to order at 6:05 p.m. and asked everyone to introduce themselves.

Introduction of Student Auto Club Members and report of Auto Body Car Club:
Phillip Palmer, Chris Candelaria and Kevin Strawder introduced themselves and Chris and Phillip presented Pat Nicoll a framed thank you letter for his contributions to the Auto Club. With those contributions, they were allowed to print flyers and tickets for the 350 GM Engine raffle.

Chris announced that the Car Show is coming back to AHC – the date has been set for Saturday, March 29, 2014 and entries will include: Domestic, Import and other Class Entries. The registration fees will be $15 or $30 with lunch and a t-shirt.

Chris also shared the information on the 350 GM Engine. Only 2,000 tickets have been printed and they are selling for $10 each or 6 for $50. He encouraged Advisory Committee Members to take tickets and sell them. The drawing will be on Friday, April 4th during the Industrial Career Expo in the new building.

A carwash will be planned for the car club sometime in the Spring.

Review of the Advisory Committee meeting minutes from December 19, 2012:
Minutes were distributed and Tim Muscio made a motion and Andy Motter seconded it to approve the minutes as written. A vote was taken and it passed.

Ron added discussion on the decision to eliminate the prerequisite for AT 344 (SMOG class). He said that the Spring 2014 class is almost full and there is no way of knowing if the students are qualified to take this class. Patrick shared that at DeAnza Community College, the instructors conduct interviews for students before they are allowed in the class. Patrick said he would review the way Banner works and talk to counseling on how they can help the Auto Tech program work for this class.

Ron and Richard also shared that the SMOG Licensing is changing and that on the first day of class, students must be told that ASE has tighten the standards to include A6 and A8 concurrent with SMOG license and the two year work experience.

Video Tour of New Building:
July 2012 – Groundbreaking at Allan Hancock College for the new Industrial Technology Complex. Patrick shared a video that showed the 4,100 sq. ft. of the new Auto Tech lab as compared to the existing 2,800 sq. ft. He showed the solar tubes throughout the building and the roll up doors that have pillars in between them. There is a library for

reference material and there will be dedicated Engine Machining and Transmission labs. The labs are connected indoor and outdoor and there is a covered area for the alignment rack. Traffic may be a problem. The Auto Tech lab is located next door to the machining lab. It is unknown if the move will happen before classes begin on Tuesday, January 21st and that decision will be made on Friday, December 6th.

Student Learning Outcomes (SLOs): Patrick explained what the program student learning outcomes and course student learning outcomes were and asked for input from the committee on reviewing every class and their SLO's estimating that it would be about 30 minutes per course. Tim, Pat and Andy all agreed to help with this project. Discussion on online auto tech training classes: Andy said that he was very familiar with UTI and GM and felt that there were some good products on the market.

ASE exams: Patrick feels that taking the test is a good goal for students as they leave AHC. Tim agreed that the combination of a degree and a certificate show incentive on the part of the student. Mat feels it is critical for students to complete the ASE test and that employers should pay more per hour for those students that complete them. The last ASE test for Fall 2013 is Tuesday, November 26th starting at 3:00 p.m. Tim asked if more exams could be given in the evening. Marna asked if everyone knew about the testing and how to get the word out on what is needed to register. She also shared that she had approximately 20 phone calls during the summer asking for information on testing and both the test center and the I.T. dept. offices were closed during that time, so no one was able to give information out on testing. Patrick shared that Prometrics (the ASE test site) does not recognize AHC as a test site and that he tells his students to register, pay and then call AHC and get placed. Marna shared that a lot of information is needed to get registered with AHC and tells people to send emails to Anne Cremarosa instead of calling.
Action item: The Advisory Committee Members felt strongly that ASE testing is important and that AHC must be listed on the Prometrics site.

Snap on Tool discounts: A discussion took place on whether students should be required to have their own hand tool sets. Snap on gives student discounts as well as Matco Tools and Sears. Everyone on the advisory committee agreed that owning a tool set is a requirement to be employed in the industry. Patrick asked about a lab fee or an increase in lab fees and most people felt that we would lose enrollment if that happened. DeAnza CC requires students to have tools the first day of class. Students must be full time (12 credits or more) to receive the Snap on Tool discounts.

AT 100 – Mat said that it is hard to teach basic car maintenance and repair without the vehicles in the lab. His class teaches the basics on checking the car and writing the repair order. With only 2 hours for each lab, it is hard to do that with the student cars that must pull in and then get out during the two hour time period. Ron suggested that some labs be 3 hours in length. Mat also shared that the current book is 50 chapters and over the course of a 16 week semester class, not all chapters are taught. Loren highlighted that what he teaches in AT 100 at AHC in ½ year is what he taught for one year at Arroyo Grande HS in auto tech.

Program Review: Completed for Spring 2013. This is an annual update required by the college. It does require employment numbers (EDD 10 year period) and the committee discussed the actual employment figures vs. those published by the Labor Bureau. Patrick admitted that low numbers make it hard to justify getting funding for programs and he believed that the number of ten new positions per year in the Auto Tech industry for SB County was way too low. Michael Johnson reminded the committee of the lack of high school programs, Lompoc HS is one of the only Auto Tech programs in the area.

Budget: Patrick shared that although enrollment has increased, the district budget has gone down from $7,000 to $4,250 in the last five years. This amount of money is for supplies to run the auto tech shop.

Grants: Nancy Miller, Director, CTE, Lucia Mar SD represents the Five Cities area including Nipomo. Nancy shared that she represents both Northern SB and San Luis Obispo Counties. The focus on grant funding right now is on how to bridge the gap between high school and community college. Her current project is Arroyo Grande HS where she is adding hybrid, electrical car and biofuel/fuel cell cars to the auto tech program. She is emphasizing environmental /and water resources as well.

One current focus is on Environmental Green Technology with certification at the high school level. She spoke of "regional" meetings for high school and college CTE instructors to work together and said the first place to start would be to identify the skill levels needed out of the high school. Patrick recognized that the higher level CTE classes are usually light in enrollment and that colleges usually cut those classes first. Consensus was that the current articulation is outdated and that credit by exam would help identify the strongest students for entry level classes. The old method of sending a student home with a piece of paper does not work for articulation. Instead the credit exam and an electronic format would be better. Ron emphasized that all of this would have to be done early on since registration for the Auto Tech classes always goes fast.

Nancy shared that there are currently five grants (CTE) that she would like to collaborate with AHC on. She explained that the funding at the State level includes Perkins with an emphasis on dual enrollment or at least high school credit received for college courses.

Grants at AHC: Patrick shared that he has tried twice to get funds for hand tools for his students. In one case, the funding was promised and then after all the work was done, denied. In the other case, it was not prioritized. He asked for input on other needs:
Ron and Richard explained the new SMOG licensing and said that a $4,000 computer was essential and in fact, needed to be in place April 2014 to meet the new requirements. The machine (ESP) will only work on cars that were built in 2000 and later. This would be used for the AT 344 BAR class.
Patrick shared that some of the items in his lab may not make the move. He needs a new Hunter Alignment Lift and also new Dynometer both over $60,000 each.

Faculty Report Out: Patrick McGuire:
Fulltime Faculty Position: Has been submitted to AHC administration.
Lab Assistant: Is approved and will be filled for Spring 2014 semester.
New Building: Moving in at the end of Spring Semester – estimated May 2014.
Curriculum Changes: Four course changes:
AT 133 – Auto Engine Rebuilding – change from engine rebuilding to Engine Mechanical Repair to better align with NATEF standards.
AT 303 – Auto Electricity – Added one hour per week to better cover sophisticated electrical systems.
AT 306 – Auto Air Conditioning – From 1 to 4 units – more time to learn the basics.
AT 334 – Auto Machining – Streamline the class to focus on the basics of engine machining, taking the advanced subject matter out of the course.

New Courses:

AT 355: Advanced Auto Machining: Additional class for subjects like flow bench, dyno testing and advanced machining.

AT 350 Skills USA – This class is designed to give selected students time to practice for and participate in the Skills USA competitions.

Diploma and Degree Changes: Proposed – core courses taken with a list of electives – more flexibility for students.

Other information: CCCCO Earnings Report:

Automotive Technology does extremely well in the new statewide report from the Chancellor's office. Auto Tech students earning increases by 322% five years after they complete a degree and 231% with a certificate. OF the 135 AA/AS degrees studied, Auto Tech ranked 19th highest in average % increase in earnings over 5 years.

Student Success Story:

Catlyn Ortiz recently came back to visit. She was the President of the Student Auto Club in 2011/2012 and graduated with AS degrees in AT Chassis and Auto Body. She is now employed by a major auto body chain in San Diego and is the shop lead in mechanical repair work. She spoke to Art Fosters T 100 class during her visit and told them how she booked 60+ hours in one 40 Hour week.

Students from this semester and last semester are employed at

Advanced Auto	AutoZone
Bush's Automotive	Calderon's Tire
Crockett's Auto Body	Home Motors
Mastertech Automotive	Pats Automotive
Sears Auto Repair Center (SM and SLO)	

ASE TEST:

AJ Foster: Brakes Passed

Fredrico Solario – Electricity Passed

Travis Hanson – Brakes and Suspension –Passed

3 more students are scheduled for the final test date next week.

Actions to be taken/Responsible parties/Date to be completed

1. Patrick to meet with Andy and Pat and select SLO's to review/Patrick McGuire/Fall 13 & Spring 14

2. Refinement of the Employer Survey and distribution to all identified local employers/Patrick McGuire & Department Staff/Spring 2014

3. Patrick to seek funding (CTEA or other sources) for the AT 100 tool sets and the replacement of the 2nd alignment rack in the new building/Patrick McGuire with assistance of the IT Department staff/Spring 2014

4. Forwarding of these minutes to the Dean to communicate the committees' concerns regarding the following;
   Replacement of the full time faculty position
   Effects of the move on the students

Meeting adjourned at 9:00 p.m. **Minutes taken by Marna Lombardi, 11.20.13.**

Auto Tech Advisory Committee Meeting Minutes
Allan Hancock College, Wednesday, April 30, 2014

In attendance: Pat Nicoll, Chairperson; Ron Domingos, Robert Atkison; Robert Jones, Rob Hill, Tim Muscio, Travis Hansen (student) , Patrick McGuire and Marna Lombardi.

A tour of the new Auto Tech Labs in the new Industrial Technology Complex was given prior to the advisory committee meeting.

Agenda and Discussion Items:

Introduction of Advisory Committee members and Guests:

- Pat Nicoll, Chair of the Auto Tech Advisory Committee, called the meeting to order and asked everyone to introduce themselves.

Auto Student Club Report out:

- Travis Hansen, gave a report on the AHC Student Car Show held on Saturday, March 29th. It was a success with 40 cars displayed and raised $800 for the club. At the last student car club meeting it was decided to purchase a project car that could be taken to local car shows to help promote AHC and the Auto Tech and Auto Body programs. Patrick asked his advisory committee to be on the lookout for a car (not a racing car).
- Travis also shared that the raffle for the student built engine was held on Friday, April 4th and that _____ won. It raised over $2,500 in funds for the Blaine Johnson Memorial Scholarship for AHC students. It is still short of a few parts and need to be finished. Patrick recognized that Painless Performance donated parts to complete the engine.
- Travis and four other AHC students along with Bob Mabry, AHC Machine Technology Instructor, traveled to San Diego to observe the Skills USA competition over the April 26th weekend. Their purpose was to learn more about the competition so that AHC can develop teams from the Industrial Technology Department and set a goal of 2015 to compete. Travis shared that in 2006 he had competed in Indiana and that the purpose is that students are tested on skills that are required in their field of study. There were approximately 160 different competitions for high school and postsecondary. Rob Hill, Santa Ynez HS, took students from his program to San Diego and they came in 4th place. He offered his help to AHC for next year.

Skills USA:

- Patrick thanked Travis for his report and complimented him on getting a job at Home Motors. He then went on to summarize why the competition is great for students and the college and explain that students are expected to raise the funds for travel. He explained that the Industrial Technology Department has designed a course that will go across the board for all 7 of their programs that will be a "skills prep" course that will enable students to prepare for the competition in their respective fields. The Regional's take place in January and right now the college is approving the new course for FALL 2014 schedule although it will not be in the catalog yet.

Faculty update:

- All of these suggestions were incorporated after hearing from the Advisory Committee members in earlier meetings.

- Added Skills USA Course
- Increased the number of credits for the Auto Electricity Course
- Auto Tech Air Conditioning course went from 1 unit to 4 units
- Clean Air Class was very popular and is being offered again in the Fall
- Added an advanced machining course for Auto Tech
- Students can now focus on a major and pick an area of concentration in the Auto Tech program. They have a core of 30 units in Auto Tech and then can pick Electricity; Fuel Injection; Engine Performance , Rebuilding, etc.

- Over $80,000 of new equipment was ordered in the last month. This includes:
  - New Alignment rack, four new tool chests and sets of tools, a tire changer and a full set of alignment tools.
- Lab layout:
  - The Hunter Alignment Rack will stay in place in the old lab area.
  - There is a shortage of classroom space. Ron Domingos explained that many misconceptions of CTE include that all teaching is in the lab and that is not correct. The classrooms are used heavily in conjunction with the hands-on learning in the labs. The lecture is a viable part of the Auto Tech Program.
  - Goal: To keep the current space as well as move into the new classrooms and lab in the new building.

Staffing

- Tim Muscio has been hired as an instructional lab assistant for 19 hours a week. This has helped the program immensely and was a team effort to get that approved as a permanent position.
- A new F/T faculty member has been approved and the hiring process will take begin in May/June. Advertising for this position was national. This is a huge deal because at the college, 10 full time faculty members have retired and only 6 were approved to replace them and one of them is in Auto Tech.
- Patrick asked for recommendations on a teaching demonstration for a 30 minute presentation, so that the committee could see if that person could teach. Suggestions included:
  - Have hard / dumb questions by students.
  - Look at voltage drops, evaporation monitors/emissions

Students:

- 19 students will be getting their A.S. Degrees in Auto Tech this May. David Hernandez has been great help to the program and was showcased in a recent Kevin Walthers newsletter on his work with the Auto Tech Program in getting students to follow through with their certificates. This program was so successful that the counseling office has assigned someone to work with the Welding Department to do the same.

Funding:

- Patrick recently wrote CTEA proposals for three areas:
  - Student "loaner" tool sets; new SMOG machine and

Student Internships:

- Pilot program, three binders of over 40 student applications and recommendations. The binders were given to Home Motors, Honda and Napa Auto Parts. This year, will be a very

preliminary process in which the students will be hired as employees and from this process, an internship program will be developed. The college is working on strengthening Cooperative Work Experience (CWE) classes and that will be incorporated into the internship.

- Ron shared his experience with CWE and how it works with student goals and visits to the worksite by AHC faculty members.
  Robert Atkison said that there are 10 dealerships in Santa Maria that would like to work with AHC on curriculum for the program and focus on basic work skills. He emphasized that industry is having a hard time finding techs that can sell service.
- Patrick explained that Palmdale HS in Lancaster CA has a program that rotates students through service programs three days a week with dealerships and independents.
- Robert Jones talked about the T-10 Toyota program and its success with setting goals for students to develop meaningful work experiences.
- Everyone agreed that they would discuss this in the Fall and learn from the summer hires and that paperwork should be minimized for the industry partners.

New Building Updates: Move this summer.
Equipment needed and strongly recommended by the Advisory Committee:

- New Engine Hoist
- More transmission benches
- Ron requested new keys for the summer months to the new lab

Patrick shared that the Johnson Family has been very supportive and may be able to help with cabinets. Ron explained that the Modern Marvels (a TV Show?) focused on Santa Maria and a 20 minute summary of their business here. Patrick shared that two of his students are currently working there.

Scholarships:

- Marna shared that 22 students will receive 27 scholarships from the Industrial Technology Department and that 805 of the total dollars went to Auto Body and Auto Tech students. She also encouraged anyone to decide if they would like to donate to the general VICA scholarship for I.T. or establish a scholarship in their own name.
- She passed out the flyers for the MODEL A club BBQ raffle and car show for September in Orcutt. The funds from their raffle help with the scholarship in their own name.

ASE TESTING:
the test dates have been set for May . Tim Muscio will be a proctor for the testing.
Patrick needs to see if he can get ASE to list AHC as a test site.

Meeting adjourned at 8:05 p.m. Minutes taken by :

Marna Lombardi, Industrial Technology Department Secretary.

Next meeting will be in November 2014.

Auto Tech Advisory Committee Meeting

Allan Hancock College Conference Room O-102
Wednesday, March 25, 2015 from 6:00 – 8:15 p.m.

In attendance: Andy Motter, John Henry, Pat Nicoll, Patrick McGuire, Rob Hill, , Steve Munoz, Tim Muscio, Marna Lombardi, Alex Medeli, and Tom Diaz

Welcome: Pat Nicoll, Advisory Committee Chairperson

Agenda and discussion items:

- Introduction of Advisory Committee Members
- Review of the minutes from the last Auto Tech advisory's meeting (April 30th, 2014) Pat McGuire made a motion to accept the minutes as written and Pat Nicoll seconded it. A vote was taken and the motion was carried.

Tour of Auto Tech lab: Patrick gave everyone a tour of the new labs

Discussion:

Update from Faculty:

Demographics on program and students (highlights):

- 3/4 rds of Auto Tech students are receiving financial aid.
- There are 430 jobs in the Santa Maria area that are in the auto tech industry. It is estimated that growth will be 7% per year for 30 new jobs.
- The Auto Training Managers council highlights the need in Electrical, transmission and Advanced Engine rebuilding.
- 92 degrees were rewarded in 2014 and 15% of all the AS degrees in the State in Auto Technology were from AHC's program. David Hernandez, CTE Counselor has been collecting data on students that have completed the program requirements and just need to finish paperwork. This is expanding to Auto Body as well.

Existing and New curriculum

- Patrick asked the group about their input on **Diesel and Hybrid** additions to the Auto Tech Program at AHC:
- Jay Storey used to teach the Diesel classes and it was a struggle to fill the classes with the required 15 students
- Patrick believes that each class should be focused on the ASE test parameters and he uses those tests as his student learning outcomes so A9 would be the basis of Diesel.
- Steve Munoz believes that there should be an advanced Diesel class after students had mastered the majority of the other Auto tech classes.
- AHC has the space, they have an experienced instructor. To design a course the process through the Chancellor's office is pretty extensive. Certificates are usually 28 -34 credits.

Patrick also explained how classes cannot be repeated and some options with Community Ed classes.

- The new technology on the Hyper Diesel should be reviewed. The summary was Patrick should look into this and keep the three alternate auto technologies on the radar – including CNG, Diesel and Hybrid.
- Discussion summarized that there is not much need for Hybrid maintenance since the dealerships handle training internally.
- Patrick was asked if there was a focus **on customer service courses or a certificate** in that area. Tom Diaz said that customer service was very important. Patrick answered that there were no classes now. Discussion took place on what the dealerships and small businesses were training employees on customer service and if this should be a separate class.
- Tom spoke of a private training facility in Temecula where Honda has classes. He offered that he could send some information.
- Steve Munoz talked about turnover in that position due to stress on productivity, profitability and being customer and mechanic focused. Customer service Managers must serve the needs of everyone.
- Marna mentioned that courses on customer service may bring more females into the program.
- Steve described his mentoring program in which he paid master mechanics a stipend to help guide the new employees on each job.
- Steve also acknowledged that he has had 3 service advisors and 10 technicians and his focus is on RETENTION of existing customers. It was suggested that Steve volunteer to be a guest speaker in one of Patrick's classes. He also filled out a volunteer form.
- Andy Motter asked if AT 100 can be used as an elective for other programs. Patrick agreed that it could be and that some CSU's accept it for transfer credit as an elective.
- Andy asked about how transfer classes from UTI worked and Patrick admitted there was not an easy solution. Everyone talked about creating a challenge test that would review a student's knowledge to let them waive a class. This would also students to skip required pre-req and/or skip pre-req and receive credit. Discussion showed benefits both ways, but it was agreed the easier route it so allow the student to skip the pre-req and NOT receive credit for the class.
- Patrick emphasized that every class has plenty of hands-on components.

Instructors in the program: Patrick is always looking for qualified instructors and the current requirements are an Associate's Degree and six years' work experience or a Bachelor's degree and two years' work experience in the industry.

Class space and times; Classes are staggered and scheduled on a rotating basis to teach needed classes for completion of degrees or certificates in both the evenings and during the days to try to be responsive to the student's work schedules

Articulation: Paperwork from both Lompoc Valley HS and Santa Ynez has been completed – AHC needs to follow up with Santa Maria HS to get that in place. Art Foster to help with that process.

Program Review: The student survey data showed that 86% of the current Auto Tech students are satisfied or highly satisfied with the program. A few improvements include lack of counseling support of knowledge of the program.

Update on SKILLS USA: Juan Bernal is competing at the State Level in Auto Tech. SKILLS USA competition is April 9th in San Diego. Cuesta College has had two national winners in Auto Tech that have gone on to International Competition. This is the first year for AHC and we are very proud of Juan's accomplishments. The SKILLS USA class for the Fall is in the works for how it is going to help more students get to competition.

1.

Scholarships: Marna shared that over $28,000 will be rewarded to the industrial Technology students from our own scholarships in May be the foundation. About 80% of the 34 recipients are from the Auto Body and Auto Tech programs.

Action items:

CWE (Cooperative Work Experience):

- Patrick has four new rolling tool chests with tools for students to use in the CWE internships. He has reviewed the college parameters and admits that there is a lot of paperwork for employers.
- Marna added that an organized student can complete the majority of the goal, time sheets and help with the deadlines.
- Patrick has encouraged his students to load their up-to-date resumes on the Career Jobs and Placement (CJP) website and will review how employers can access the job portal to see those resumes.
- The summer session is 8 weeks long and students receive credit from CWE and our hope is by the end of April to roll out the process. Those interested in interns included Sunset Honda and Pat's Auto. A faculty member from AHC will visit the job site and work with the student and employer.

CTEA funding for 2015-2016 – funding is available.

- Andy asked about Apple TV and a discussion took place on iPads in the service areas.

District Funding Requests:

- Patrick has on order a Hunter brake lathe from Clawson. It will be used in the new lab.

Advisory Membership

- Patrick suggested the Tom and Alex meet with John Stokes, Cuesta College to learn more about their program.

Program/Course Review

- Patrick is on target to complete the six year program review by the end of the semester.

Next meeting will be Fall 2015.

Minutes taken by Marna Lombardi, 03.25.15.

Attachment 9

AT Degrees and Certificates

		AUTO SERVICE MANAGEMENT (A.S.)	AUTO TUNE-UP AND DIAGNOSTIC PROCEDURES (A.S.)	AUTO ENGINE REBUILDING (A.S.)	AUTOMOTIVE CHASSIS (A.S.)	TUNE-UP EMISSION CONTROL SPECIALIST - Certificate of Achievement	ENGINE, POWER TRAINS SPECIALIST- Certificate of Achievement
Required							
AT 100 Automotive Fundamentals	4	4	4	4	4	4	4
AT 133 Automotive Engine Rebuilding	5	5		5		5	5
AT 303 Automotive Electricity	5	5	5		5	5	5
AT 313 Automotive BrakeS	4				4		
AT 314 Suspension and Alignment	4	4			4		
AT 323 Power Trains	5				5		5
AT 324 Automatic Transmissions	5						5
AT 334 Automotive Machining 1	5			5			
AT 336 Advanced Automotive Machining 2	5			5			
AT 341 Fuel Injection/Turbocharging	5		5			5	
AT 343 Automotive Tune-Up and Engine Analysis	5		5			5	
		18	19	19	22	24	24
Electives							
AT 108 Print Reading and Interpretation	3	X	X	X	X	X	X
AT 300 Industrial Math Shop Math and Measurement	3	X	X	X	X	X	X
AT 306 Automotive Air Conditioning System	4	X	X	X	X	X	X
AT 313 Automotive Brakes	4	X					X
AT 314 Suspension and Alignment	4					X	X
AT 323 Power Trains	5	X	X	X		X	
AT 324 Automatic Transmissions	5	X	X	X	X	X	
AT 334 Automotive Machining 1	4	X	X		X	X	X
AT 336 Advanced Automotive Machining 2	4				X		
AT 341 Fuel Injection/Turbocharging	5	X		X	X		X
AT 343 Automotive Tune-Up and Engine Analysis	5	X		X	X		X
AT 344 Automotive Emission Control	4	X	X	X	X	X	X
AT 350 Skills USA	4	X	X	X	X	X	X
AT 389 Independent Projects in Automotive Technology 1-3	2	X	X	X	X	X	X
AT 399 Topics in-ASE Certification Prep 2	2	X	X	X	X	X	X
BUS 104 Business Organization & Management	3	X					
BUS 107 Human Relations in Business	3	X					
MT 109 Survey of Machining	4			X			
MINIMUM ELECTIVE CREDITS		12	11	11	8	6	6
Total CREDITS		30	30	30	30	30	30
MINIMUM GENERAL EDUCATION CREDITS		21	21	21	21		
TOTAL CREDITS		51	51	51	51		
AHC Degree Avg = 29.3 unit							
AHC Cert Avg = 31 unit							
AT Staewide Degree Avg =36							
AT Statewide Cert Avg =28.4							

AUTOMOTIVE TECHNOLOGY

AT 100 Automotive Fundamentals **4 units**

Acceptable for credit: CSU

Limitation on enrollment: Be willing to safely function in the automotive workplace and follow instructions.

Designed to teach the student complete automobile care, emphasizing the operating principles and service operations on all types of automobiles and light trucks. Includes investigation of the impacts that the automobile has on modern life, the economy, and the environment. (F, S, U) (GR/P/NP)

AT 117 Print Reading and Interpretation **3 units**

Acceptable for credit: CSU

Prepares students to read engineering drawings and specifications and to enable them to understand the intent of the engineer by interpreting the relationship of two-dimensional drawings with respect to actual objects or projects. This course is not open to students who are enrolled in or have received credit for AB 330, ET 330 or MT 330 or AB/ET/MT 117. (S) (GR/P/NP)

AT 133 Automotive Engine Rebuilding **5 units**

Acceptable for credit: CSU

Prerequisite: AT 100

Limitation on enrollment: Must take and pass a lab safety test.
The intent of this course is to introduce the student to the diagnosis and repair of automotive engines. Laboratory experiences will include engine evaluation, removal, disassembly, precision measurement, inspection and evaluation of engine components, cylinder head reconditioning, engine reassembly and installation.
(S) (GR)

AT 300 Shop Math and Measurement **3 units**

~~Advisory: Eligibility for MATH 511~~

Designed as the basic mathematics class for the industrial and engineering technology student wishing to gain proficiency in the applications of mathematics to practical situations, including percentage, area, volume, and speed ratios of equipment, horsepower and the essentials of plane trigonometry. This course is not open to students who are enrolled in or have received credit for AB 381, ET 381, MT 381 or WLDT 381 or AB/ET/MT/WLDT 300. (F, S) (GR)

AT 303 Automotive Electricity **5 units**

Limitation on enrollment: Must take and pass a lab safety test.

Prerequisite: AT 100

Designed to give the student a strong background in basic automotive electricity and electronic concepts. Includes discussion and hands on practice with basic theories, operation, diagnosis, and service of the electrical, electronic, and computer control systems with an emphasis on preparing the student for professional certification testing. (F, S, U) (GR)

AT 306 Automotive Air Conditioning Systems **4 units**

Prerequisite: AT 100 Advisory: AT 303

Limitation on enrollment: must take and pass a lab safety test.

In this course students study the theory, operation, diagnosis, and repair of automotive heating, air conditioning and engine cooling systems. (F, S) (GR/P/NP)

AT 313 Automotive Brakes **4 units**

Prerequisite: AT 100

A comprehensive examination of automotive and light truck brakes. Emphasis on repair and troubleshooting of domestic and import systems, drum and disc mechanical systems, power brake systems, anti-skid systems and computerized brake systems. (F) (GR/P/NP)

AT 314 Suspension and Alignment **4 units**

Prerequisite: AT 100

Designed to familiarize the student with the theory of suspension design and the repair and alignment of automotive suspensions, including long and short-arm suspension, McPherson Struts, Solid Axle and Twin I Beam types. (S) (GR/P/NP)

AT 323 Power Trains **5 units**

An introduction and comprehensive examination of automotive drive lines and differentials; manual transmissions; manual transaxles; automatic transmission fundamentals; flywheel and clutch and 4-wheel drive. Emphasis is placed on principles of operation, trouble-shooting and intensive repair. (F) (GR/P/NP)

AT 324 Automatic Transmissions **5 units**

Prerequisite: AT 100

Designed to make the student proficient in four popular automotive transmissions: G.M., Ford, and Chrysler and foreign. Emphasis is on competent repair and troubleshooting of the automatic transmission. (S) (GR/P/NP)

AT 334 Automotive Machining 1 **~~5~~ 4 units**

Prerequisite: AT 133

An intensified course in automotive machining, it will emphasize student proficiency in machine operation. Content focuses on technological knowledge and methods used in today's automotive shops. (S) (GR/P/NP)

AT 336 Advanced Automotive Machining 2 **~~5~~ 4 units**

Limitation on enrollment: Must take and pass a lab safety test.

Prerequisite: AT 334

An advanced course focused on precision and performance engine preparation. Topics to be covered include engine components selection, machining and measurement for maximum engine efficiency and output. (F, S) (GR/P/NP)

AT 341 Fuel Injection/Turbocharging **5 units**

Advisory: AT 303 or concurrent enrollment in AT 303 or high school automotive electrical study.

This course provides theory and application of automotive fuel supply and fuel injection systems. The course includes basic engine, fuel supply, fuel injection, turbocharging, and computerized engine controls diagnosis and repair. (F, S1) (GR/P/NP)

AT 343 Engine Performance Diagnosis **5 units**

Advisory: AT 341 or prior basic engine performance and fuel system training.

This course is designed to give students a basic knowledge of engine diagnostic tools and a working ability to diagnose engine performance problems. The course includes fuel, ignition, computerized engine controls, and emission controls related systems. (S, F1) (GR/P/NP)

AT 344 Emission Control/BAR/CAC **4 units**

Advisory: AT 341 and AT 343

This course provides theory and diagnosis of automotive emission control systems. The course includes the BAR (Bureau of Automotive Repair) CAC (Clean Air Car) course preparation and certification. (S2) (GR/P/NP)

AT 379 Experimental Courses in Automotive Technology 0.5 to 10 units

For course description, see "Experimental Courses."

AT 389 Independent Projects in Automotive Technology 1to 3 units

For course description see "Independent Projects."

AT 399 Special Topics in Automotive Technology **0.5 to 3 units**

Acceptable for credit: CSU, UC

For course description, see "Special Topics."

2012-2013

Date BOT Approved: Spring 1988
Date Reviewed: Fall 2012
Date Reviewed: Fall 1991
PCA Established: _____
Date DL Conversion Approved _____

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology
Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: **Industrial Technology**

PREFIX & NUMBER: AT 100

CATALOG COURSE TITLE: Automotive Fundamentals

BANNER COURSE TITLE: Automotive Fundamentals

UNITS: 4.0

TOTAL NUMBER OF CONTACT HOURS: 6.0

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3.0	48 - 54	3.0
Lab:	3.0	48 - 54	1.0
Total Contact Hours:	6.0	96 - 108	4.0

GRADING OPTION: Letter Grade, Pass/No Pass

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT:
Be willing to safely function in the automotive workplace and follow instructions.

PREREQUISITE SKILLS
Upon entering this course, the student should be able to:
N.A.

ADVISORY SKILLS
Upon entering this course, the advisory skills are to:
None

CATALOG DESCRIPTION

Designed to teach the student complete automobile care, emphasizing the operating principles and service operations on all types of automobiles and light trucks. Includes investigation of the impacts that the automobile has on modern life, the economy and the environment.

COURSE CONTENT

	WEEKS
1. Shop, Environmental and Personal Safety	2
2. Tools and Technical Information Retrieval	1
3. Fundamental Systems of the Automobile	1
4. Environmental, Economic and Social Impacts of the Automobile	1
5. Suspension System and Service	1
6. Brake Systems and Service	2
7. Electrical and Electronic Systems and Service	3
8. Powertrain Systems and Service	3
9. Drivetrain Systems and Service	2

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. know the safe procedures for using the equipment and tools in the automotive shop
2. know where to find the correct repair and maintenance procedures and specifications for passenger cars and light trucks
3. know the correct application and usage of the tools encountered in the diagnosis, repair and maintenance of passenger cars and light trucks
4. know the proper procedures for diagnosis, repair and maintenance of passenger cars and light trucks
5. know the correct terminology for the parts, components, systems and tools encountered in the diagnosis, repair and maintenance of a passenger car or light truck.
6. have knowledge of the impact that transporting people and goods has on the economy and the environment
7. know how to safely and successfully complete simple diagnosis, repairs and maintenance of a passenger car or light truck through the correct application of procedures, specifications and tools
8. know how to document through written records your work in the diagnosis, repair and maintenance of a passenger car or light truck
9. be able to meet educators and employers expectations for active and productive participation in group tasks
10. be able to meet educators and employers expectations of individual work quality, output, participation and ethical behavior
11. be able to minimize the impact your activities have on the environment

METHODS OF INSTRUCTION

Methods of Instruction
Lecture, demonstrations, guided laboratory exercises.

OUTSIDE ASSIGNMENTS

Outside Assignments
Chapter reading assignments Answer review questions for each unit

METHODS OF EVALUATION

Methods of Evaluation
Tests, Quizzes, Homework Assignments, Notebook, Participation, Lab Records

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

Adopted Text: Automotive Service, Gilles 2012

Supplemental Readings and/or Other Materials:
3" notebook, Safety glasses, appropriate attire for lab work.

STUDENT LEARNING OUTCOMES - Upon successful completion of this course, you should:

1. know the safe procedures for using the equipment and tools in the automotive shop.
2. know where to find the correct repair and maintenance procedures and specifications for passenger cars and light trucks.
3. know the correct application and usage of the tools encountered in the diagnosis, repair and maintenance of passenger cars and light trucks.
4. know the proper procedures for diagnosis, repair and maintenance of passenger cars and light trucks.
5. know the correct terminology for the parts, components, systems and tools encountered in the diagnosis, repair and maintenance of a passenger car or light truck.
6. have knowledge of the impact that transporting people and goods has on the economy and the environment

7. know how to safely and successfully complete simple diagnosis, repairs and maintenance of a passenger car or light truck through the correct application of procedures, specifications and tools.

8. know how to document through written records your work in the diagnosis, repair and maintenance of a passenger car or light truck.

9. be able to meet educators and employers expectations for active and productive participation in group tasks.

10. be able to meet educators and employers expectations of individual work quality, output, participation and ethical behavior.

11. be able to minimize the impact your activities have on the environment.

2013-2014

Date Prepared: Fall 1992
Date Reviewed: Fall 2013
Date Reviewed:
PCA Established: Fall 1992
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology
Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: AT 133

CATALOG COURSE TITLE: Automotive Engine Rebuilding

BANNER COURSE TITLE: Automotive Engine Rebuilding

UNITS: 5

TOTAL NUMBER OF CONTACT HOURS: 144-162

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3	48 - 54	3
Lab:	6	96 - 108	2
Total Contact Hours:	9	144 - 162	5

GRADING OPTION: Letter Grade Only

PREREQUISITE(S): AT 100

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: *(Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
Must take and pass the Lab Safety Test.

PREREQUISITE SKILLS *(The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:

1. know the safe procedures for using the equipment and tools in the automotive shop
2. know where to find the correct repair and maintenance procedures and specifications for passenger cars and light trucks
3. know the correct application and usage of the tools encountered in the diagnosis, repair and maintenance of passenger cars and light trucks
4. know the proper procedures for diagnosis, repair and maintenance of passenger cars

and light trucks

5. know the correct terminology for the parts, components, systems and tools encountered in the diagnosis, repair and maintenance of a passenger car or light truck.
6. have knowledge of the impact that transporting people and goods has on the economy and the environment
7. know how to safely and successfully complete simple diagnosis, repairs and maintenance of a passenger car or light truck through the correct application of procedures, specifications and tools
8. know how to document through written records your work in the diagnosis, repair and maintenance of a passenger car or light truck
9. be able to meet educators and employers expectations for active and productive participation in group tasks
10. be able to meet educators and employers expectations of individual work quality, output, participation and ethical behavior
11. be able to minimize the impact your activities have on the environment

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*

Upon entering this course, the advisory skills are to:

None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

The intent of this course is to introduce the student to the diagnosis and repair of automotive engines. Laboratory experiences will include engine evaluation, removal, disassembly, precision measurement, inspection and evaluation of engine components, cylinder head reconditioning, engine reassembly and installation.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on 16 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Shop Safety and Environmental Protection.	1
2. Tools and equipment, Precision measurement	1
3. Introduction to machine processes, information sources	1
4. Fasteners & engine hardware, engine fundamentals, types, construction and	1

components

5. Engine removal	1
6. Engine disassembly	1
7. Engine sub-systems, component inspection & diagnosis	2
8. Cylinder head reconditioning	1
9. Cylinder bore reconditioning	1
10. Rotating assembly reconditioning	1
11. Engine Combustion and Fuels	1
12. ASE Certification	1
13. Starting, charging, ignition and emission systems	1
14. Engine assembly	1
15. Engine installation	1

COURSE OBJECTIVES:
At the end of the course, the student will be able to:

1. Function in safe manner in an automotive repair facility
2. Correctly deal with hazardous materials encountered in the repair of an automotive engine.
3. Perform precision measurement and know the proper care and operation of precision measurement tools.
4. Be familiar with all of the machine processes for engine remanufacturing.
5. Locate, evaluate and use the proper information sources needed in the engine rebuilding process.
6. Identify engine cycles, types, construction and components.
7. Perform the proper diagnostic tests, evaluate the results, determine the most likely cause for the defect and the proper course of action to repair the defect.
8. Compare existing component dimensions and condition to specified dimensions and condition and determine the correct course of action.
9. Remove and replace a vehicle's engine.
10. Remove and replace a defective engine component.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Lecture presentations and classroom discussions.
2. Instructor-guided individual and group projects on vehicles and simulators in the laboratory.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1. Read and be prepared to discuss each chapter in the text 2. Complete the review questions at the end of each chapter prior to the lecture on that topic. 3. Preview each of the laboratory assignments in the shop manual prior to that topic being covered in the laboratory demonstration. 4. Read and be prepared to discuss any handouts prior to the next meeting.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Chapter Review Questions for each reading assignment. 2. In Class Quizzes for each unit. 3. Unit Tests for each unit. 4. Student Notebook (Portfolio) for the entire semester. Will contain the record of all student work including assignments and lab work record. 5. Laboratory Record of each assignment in lab. 6. ASE Test Results for the student if taken during the semester. 7. Final Exam to assess student learning outcomes during the semester.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: Auto Engine Repair Student Bundle W/ CD Workbook, Duffy, ISBN 9781605251936, Copyright 2010, Edition 5

Supplemental Readings and/or Other Materials: Articles and excerpts from trade sources as assigned.

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Identify safe and unsafe procedures for machining components in the automobile.
2. Identify where to find the correct procedures and specifications for the mechanical repair of automotive engine and its related components.
3. Explain the proper procedure for using the tools involved in the mechanical repair of the automotive engine and its related components.
4. Describe the proper procedure for diagnosing mechanical problems with the automotive engine and its related components.
5. Demonstrate the ability to properly use the tools involved in the mechanical repair of the automotive engine and its components.
6. Diagnose mechanical problems with the automotive engine.
7. Demonstrate the ability to work on automotive engines with accuracy, dependability, proficiency and in a timely and safe manner.
8. Demonstrate the ability to work independently and in groups to service, repair, test, and maintain the mechanical systems of the automotive engines.
9. Demonstrate the ability to work independently and in groups to service, repair, test, and maintain the mechanical systems of the automotive engines.
10. Demonstrate the ability to meet employer expectations for employees within the automotive machining shop.

Date BOT Approved: _____
Date Reviewed: Fall 2013
Date Reviewed: _____
PCA Established: Fall 2013
Date DL Conversion Approved _____

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology
Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: **INDUSTRIAL TECHNOLOGY**

PREFIX & NUMBER: AT 303

CATALOG COURSE TITLE: Automotive Electricity

BANNER COURSE TITLE: Automotive Electricity

UNITS: 5

TOTAL NUMBER OF CONTACT HOURS: 144-162

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3	48 - 54	3
Lab:	6	96-108	2
Total Contact Hours:	9	144-162	5

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): AT100

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*

Must take and pass the Lab Safety Test.

PREREQUISITE SKILLS *(The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*

Upon entering this course, the student should be able to:

1. Know the safe procedures for using the equipment and tools in the automotive shop.
2. Know the correct application and usage of the tools encountered in the diagnosis, repair and maintenance of passenger cars and light trucks.
3. Know how to safely and successfully complete simple diagnosis, repairs and maintenance of a passenger car or light truck through the correct application of procedures, specifications and tools.

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*

Upon entering this course, the advisory skills are to:

None

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

Designed to give the student a strong background in basic automotive electricity and electronic concepts. Includes discussion and hands on practice with basic theories, operation, diagnosis, and service of the electrical, electronic, and computer control systems with an emphasis on preparing the student for professional certification testing.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on 16 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Electric circuits and Ohm's law, electric components, review of safety, electronic components and principles	2
2. Tools and test equipment, wiring and wiring repairs, manufacturer service information	3
3. Basic electrical tests, automotive computer operation, on-board diagnostics and scan tools, sensor, actuator, computer service	3

4. Battery technology, starting, charging, ignition, fuel and emission control systems diagnosis and repair 3
5. Lighting, instrumentation, navigation, wiper and horn, security, entertainment, restraint, chassis systems diagnosis and repair 3
6. Advanced diagnostics, professional certification and State licensing 2

COURSE OBJECTIVES:
At the end of the course, the student will be able to:

1. Identify where to find the correct procedures and specifications for the repair of automotive electrical/electronic systems and related components.
2. Explain the proper procedure for using the tools involved in the repair of the automotive electrical/electronic systems and its related components.
3. Describe the proper procedure for diagnosing problems with the automotive electrical/electronic systems and its related components.
4. Demonstrate the ability to properly use the tools involved in the repair of the automotive electrical/electronic systems and its components.
5. Diagnose problems with the automotive electrical/electronic systems.
6. Demonstrate the ability to work on automotive electrical/electronic systems with accuracy, dependability, proficiency, and in a timely and safe manner.
7. Demonstrate the ability to work independently and in groups to service, repair, test, and maintain the systems of the automotive electrical/electronic systems.
8. Demonstrate the ability to meet employer expectations for employees within the automotive repair shop.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Lecture presentations and classroom discussions.
2. Instructor-guided individual and group projects on vehicles and simulators in the laboratory.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1. Read and be prepared to discuss each chapter in the text.
2. Complete the review questions at the end of each chapter prior to the lecture on that

topic.
3. Preview each of the laboratory assignments in the shop manual prior to that topic being covered in the laboratory demonstration.
4. Read and be prepared to discuss any handouts prior to the next meeting.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Chapter Review Questions for each reading assignment.
2. In Class Quizzes for each unit.
3. Take Home Tests for each unit.
4. Unit Tests for each unit.
5. Student Notebook (Portfolio) for the entire semester. Will contain the record of all student work including assignments and lab work record.
6. Laboratory Record of each assignment in lab.
7. ASE Test Results for the student if taken during the semester.
8. Final Exam to assess student learning during the semester.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: Auto Electricity and Electronics, Duffy, 2009, ISBN 9781590709122, 5th Edition

Supplemental Readings and/or Other Materials: Articles and excerpts from trade sources as assigned.

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Identify where to find the correct procedures and specifications for the repair of automotive electrical/electronic systems and related components.
2. Explain the proper procedure for using the tools involved in the repair of the automotive electrical/electronic systems and its related components.
3. Describe the proper procedure for diagnosing problems with the automotive electrical/electronic systems and its related components.
4. Demonstrate the ability to properly use the tools involved in the repair of the automotive electrical/electronic systems and its components.
5. Diagnose problems with the automotive electrical/electronic systems.
6. Demonstrate the ability to work on automotive electrical/electronic systems with accuracy, dependability, proficiency, and in a timely and safe manner.
7. Demonstrate the ability to work independently and in groups to service, repair, test, and maintain the systems of the automotive electrical/electronic systems.
8. Demonstrate the ability to meet employer expectations for employees within the automotive repair shop.

DISTANCE LEARNING COURSE STATUS

If your course doesn't have a DL component, you don't need to fill out this section.

Method of instruction: Indicate primary modality (check one):

- ☐ Internet
- ☐ Other (**please list modalities to be used):**

Instructor-Student Contact: hours per week

Method of Contact

Please check below the methods that may be used for this course:

Per Week

- ☐ e-mail communication (group and/or individual communications)
- ☐ Listserv
- ☐ Chatroom
- ☐ Discussion Board via Blackboard
- ☐ Telephone contacts
- ☐ Social Networking pages [i.e. Ning, Facebook, VoiceThread]
- ☐ Other (please specify):

Per Semester (in person contact)

- ☐ Orientation sessions
- ☐ Group Meetings
- ☐ Review Session
- ☐ Labs
- ☐ Testing
- ☐ Other (please specify):

Adjustments to assignments:

Adjustments to evaluation:

Accessible to students with disabilities: YES

On-line services notification:

Note: If you want a DL component in your course, you need to submit the Request for Distance Learning (DL) Offering to AP&P.

2013-2014

Date BOT Approved: _____
Date Reviewed: Fall 2013
Date Reviewed: _____
PCA Established: Fall 2013
Date DL Conversion Approved _____

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology
Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: AT 306

CATALOG COURSE TITLE: Auto Air Conditioning Systems

BANNER COURSE TITLE: Auto Air Conditioning Systems

UNITS: 4

TOTAL NUMBER OF CONTACT HOURS: 96-108

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3	48 - 54	3
Lab:	3	48 - 54	1
Total Contact Hours:	6	96 - 108	4

GRADING OPTION: Letter Grade Only

PREREQUISITE(S): AT100

COREQUISITE(S): None

ADVISORY(IES): AT303

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*

Must take and pass the Lab Safety Test.

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*

Upon entering this course, the student should be able to:

1. know the safe procedures for using the equipment and tools in the automotive shop
2. know where to find the correct repair and maintenance procedures and specifications for passenger cars and light trucks
3. know the correct application and usage of the tools encountered in the diagnosis, repair and maintenance of passenger cars and light trucks

4. know the proper procedures for diagnosis, repair and maintenance of passenger cars and light trucks
5. know the correct terminology for the parts, components, systems and tools encountered in the diagnosis, repair and maintenance of a passenger car or light truck.
6. have knowledge of the impact that transporting people and goods has on the economy and the environment
7. know how to safely and successfully complete simple diagnosis, repairs and maintenance of a passenger car or light truck through the correct application of procedures, specifications and tools
8. know how to document through written records your work in the diagnosis, repair and maintenance of a passenger car or light truck
9. be able to meet educators and employers expectations for active and productive participation in group tasks
10. be able to meet educators and employers expectations of individual work quality, output, participation and ethical behavior
11. be able to minimize the impact your activities have on the environment

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*

Upon entering this course, the advisory skills are to:
General knowledge of automotive electrical systems and electronics.

CATALOG DESCRIPTION
The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

In this course students study the theory, operation, diagnosis, and repair of automotive heating, air conditioning and engine cooling systems.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on 16 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Introduction to Automotive Heating, Air Conditioning, and Ventilation. Shop Safety and Environmental Protection	1
2. HVAC Tools, Equipment, and Service Information. HVAC Electrical and Electronic Fundamentals	1
3. Principles of Refrigeration	1

	Refrigerants, Refrigerant Oils, and Related Chemicals. Hoses, Lines, Fittings, & Seals	
4.	Compressors, Clutches, and Drives. Evaporators, Condensers, Accumulators, and Receiver-Driers	1
5.	Engine Cooling Systems and Vehicle Heaters	2
6.	Control Valves and Switches. Air Delivery Systems. Manual HVAC Controls. Automatic Temperature Control Systems	1
7.	Refrigeration System Diagnosis and Leak Detection	1
8.	Refrigerant Recovery, Recycling, and Handling	1
9.	Hose, Line, Fitting, and O-ring Service	1
10.	Compressor and Clutch Service	1
11.	Valve, Evaporator, Condenser, and Related Parts Service	1
12.	Heater and Engine Cooling System Service	1
13.	Air Delivery and Manual HVAC Control Service	1
14.	Automatic Temperature Control System Service	1
15.	Air Conditioning System Installation and Retrofitting	1

COURSE OBJECTIVES:
At the end of the course, the student will be able to:

1. Describe the condensing unit cycle.
2. Diagnose cause of failure of the condensing unit to cool the automobile.
3. Use proficiently Halogen leak detector, electrical test equipment, manifold gauge sets and special tools.
4. Flush, evacuate and recharge the condensing unit.
5. Replace a clutch, clutch bearing and compressor seal.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Lecture presentations and classroom discussions.
2. Instructor-guided individual and group projects on vehicles and simulators in the laboratory.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1. Read and be prepared to discuss each chapter in the text.
2. Complete the review questions at the end of each chapter prior to the lecture on that topic.
3. Preview each of the laboratory assignments in the shop manual prior to that topic being covered in the laboratory demonstration.

4. Read and be prepared to discuss any handouts prior to the next meeting.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Chapter Review Questions for each reading assignment.
2. In Class Quizzes for each unit.
3. Take Home Tests for each unit.
4. Unit Tests for each unit.
5. Student Notebook (Portfolio) for the entire semester. Will contain the record of all student work including assignments and lab work record.
6. Laboratory Record of each assignment in lab.
7. ASE Test Results for the student if taken during the semester.
8. Final Exam to assess student learning outcomes during the semester.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: Auto Heating and Air Conditioning, Birch, ISBN 9780132551533, 2012, 6th Edition

Supplemental Readings and/or Other Materials: Articles and excerpts from trade sources as assigned.

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Describe the condensing unit cycle.
2. Diagnose cause of failure of the condensing unit to cool the automobile.
3. Use proficiently Halogen leak detector, electrical test equipment, manifold gauge sets and special tools.
4. Flush, evacuate and recharge the condensing unit.
5. Replace a clutch, clutch bearing and compressor seal.

Date Prepared: Fall 1987
Date Reviewed: Fall 1991
Date Reviewed:
PCA Established:

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

Prefix & No. AT 313 Catalog Title Automotive Brakes

Units 4 Weekly lecture hours 3 Weekly lab hours 3 Department Industrial Technology
Credit/No Credit Option

Catalog Prerequisites: AT 100.

CATALOG DESCRIPTION

A comprehensive examination of automotive and light truck brakes. Emphasis on repair and troubleshooting of domestic and import systems, drum and disc mechanical systems, power brake systems, anti-skid systems, and computerized brake systems.

COURSE GOALS: To encourage and enable students to

1. understand the technical methodology of brakes.
2. diagnose brake problems.
3. repair all types of brake systems and brake troubles.

INSTRUCTIONAL OBJECTIVES: At the end of the course, students will demonstrate the ability to

1. assess braking malfunctions, using technical data for researching specifications.
2. inspect and distinguish faults in braking systems.
3. distinguish the unique differences between conventional drum, power drum, disc, and anti-skid computer operated braking systems.
4. analyze, evaluate and repair the different brake systems in objective #3.
5. perform the evaluation tests and operate the equipment necessary to correct braking problems.

COURSE OUTLINE

	WEEKS
1. Introduction	1
A. class requirements	
B. notebook and equipment needed	
2. Hydraulic Brake Fundamentals	2
A. Pascal's Law	
B. hydraulic system maintenance and service	
3. Drum Brake System	3
A. the duel servo-bendix brake	
B. uni-servo brakes	
C. troubleshooting	
d. service	

4. Disc Brake Systems 2
   A. floating caliper disc brake/multiple piston disc brakes
   B. troubleshooting disc brakes
   C. repair of disc brakes
5. Power Assist Systems for Brakes 3
   A. vacuum assisted units
   B. electro/hydraulic assisted systems
   C. hydro/boost systems
6. Anti-Skid Brake Systems 3
   A. G.M.
   B. Ford Motor Company
   C. Chrysler Corp.
   D. imports (Bosch)
7. Computer Systems in Brakes 3
   A. purpose
   B. troubleshooting
   C. repair

APPROPRIATE READINGS (Other than Textbook)

1. Bendix Corp. Brake Service Manual Drum & Disc.
2. Tech-Talk - Hydro Val Brakes.
3. Tech-Talk - Anti-Skid Brake Systems.
4. Motor Age - Disc Brakes - 3.
5. Motor Age - Anti-Skid Brakes.
6. Tech-Talk - Electro-Hydraulic Power Brakes.

Instructor selected data (latest information in a very rapidly changing field)

ASSIGNMENTS

Sample Assignments:

1. Take Home Tests: one for each unit (6 total) approximately 75 to l00 questions, due on unit test date, covering lecture, lab demonstrations and lab exercises.
2. Chapter Review Questions: one set for each unit. Questions extracted from the reading assignments to force reading the assignments.
3. Take Home Quizzes: Three to six per unit of study. Ten to thirty points each covering outside reading, lecture quizzes and state exam preparation.
4. Early Bird Exams: Three to six per unit of study, given at opening of each class. Covering lecture, demonstrations and readings.
5. Unit Test: one per unit. To sum up all work done on that unit of study. All homework (chapter review questions, take home tests) due on this date.

EVALUATION (The methods by which students and instructors will know how the objectives listed above have been met.)

Evaluation of student achievement is based on a point system - l/3 of which is comprised of lecture, demonstrations, and testing, l/3 homework, and l/3 lab work. The student can earn a passing grade by excelling in any one of the three areas; an excellent grade will be given to students excelling in all three areas. Evaluation of student is by use of the notebook method. The notebook consists of:

1. gradesheet - all students' grades are recorded on the first page of the notebook.
2. note section - accurate and well organized notes are important (30 points grading per notebook).
3. quizzes - daily quiz covering all three quizzes of the course are given unannounced (l0-30 points each).
4. take home test or lab book - homework assignments to prepare student for unit test (30 points each).
5. textbook chapter review questions - reenforce learning from reading, lecture and lab work (each set per unit is 30 points).
6. job sheet - listing of lab operations with designated point credit checked off by instructor to determine actual work is done in lab.
7. mid-term project (50-l00 points each).
8. extra credit - consisting of all types of student oriented work in lab or at home (5-l00 points, 500 point limit).

TEXTS AND SUPPLIES

Adopted text: To be selected

Other Materials: 1. 3" Notebook.
2. Safety shoes.
3. Uniform, safety glasses.

Date Prepared: Fall 1987
Date Reviewed: Fall 1991
Date Reviewed: Spring 2009
PCA Established: Spring 2009

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **Industrial Technology**

PREFIX & NO.: AT 314

CATALOG/SCHEDULE TITLE: Suspension and Alignment

UNITS: 4

WEEKLY LECTURE HOURS: 3

WEEKLY LAB HOURS: 4

TOTAL NUMBER OF WEEKS: 16

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): AT100

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: *(Students may be prohibited from enrolling based on health and safety issues, or the course is intercollegiate competition, or honors, or includes public performances. State the reason for limiting the enrollment.)*
Must take and pass the Lab Safety Test

ENTRANCE SKILLS *(Must be included if the course has a prerequisite. Entrance skills must come from the instructional objectives of the prerequisite course.)*
The student must have the ability to:
1. Identify general shop safety rules and procedures.
2. Utilize safe procedures for handling tools and equipment.
3. Comply with the required use of safety glasses, gloves, and shoes during lab/shop activities.

CATALOG DESCRIPTION
Designed to familiarize the student with the theory of suspension design, and the repair and alignment of automotive suspensions including long and short arm suspension, McPherson Struts, Solid Axle, and Twin I Beam types.

SCHEDULE DESCRIPTION
Theory of suspension design and the repair and alignment of automotive chassis.

COURSE GOALS:
To encourage and enable students to:
1. Diagnose front-end suspension problems.

2. Diagnose steering problems.
3. Understand the technical methodology of front suspension & suspension repairs.
4. Understand the technical methodology of alignment & computerized alignment.
5. Repair all types of suspension systems.
6. Prepare the student to pass the ASE A4 test.

INSTRUCTIONAL OBJECTIVES:
At the end of the course, the student will demonstrate the ability to:

1. Use proper terminology in writing & discussing the interaction of front-end alignment angles.
2. Analyze and evaluate likely causes of uneven tire wear and front suspension "looseness".
3. Analyze suspension and alignment systems by comparing specifications with those provided in appropriate reference manuals.
4. Diagnose and repair front suspension problems using technical data as their reference.
5. Diagnose, evaluate and repair the hydraulic and electronic power steering systems.
6. Perform alignments using conventional and computerized equipment on various automobile and light trucks.

OUTLINE OF COURSE CONTENT AND SCOPE *(Indicate all major topics to be covered and approximate number of weeks for each, based on 16 weeks)*

	WEEKS
1. Shop Safety and Environmental Protection	1
2. Basic Suspension and Steering Systems Operation	1
3. Special Service Tools and Equipment and Common Suspension System Components	1.5
4. Front Suspension Systems and Service	1.5
5. Rear Suspension Systems and Service	1.5
6. Steering Linkage and Manual Steering Gear Systems and Service	1
7. Power Steering and Four-Wheel Steering Service	1.5
8. Driveline and Wheel Components and Service	1.5
9. Electronic Suspension and Steering Systems and Service	1.5
10. Wheel Alignment Principles and Procedures	1.5
11. Suspension and Steering Troubleshooting	1.5
12. ASE Certification and Career Preparation	1

APPROPRIATE READINGS *(Other than Textbook)*
Articles and excerpts from trade sources as assigned.

OUTSIDE ASSIGNMENTS *Two hours of outside work is required for every one lecture hour. For courses 16 hours or less, the outside assignments may be completed independently by the student during or after the time scheduled for the class. (Samples of outside assignments must be reflected in this portion of the outline.) Give types of assignments and one example of a specific writing assignment.*

1. Read and be prepared to discuss each chapter in the text.
2. Complete the review questions at the end of each chapter prior to the lecture on that topic.
3. Preview each of the laboratory assignments in the shop manual prior to the topic being covered in the laboratory demonstration.
4. Read and be prepared to discuss any handouts prior to the next meeting.

EVALUATION *Describe the methods by which students and instructors will know how the objectives listed above have been met. (Give types of instruments used for purposes of evaluation and at least one specific example of an essay question requiring the student to think independently and write).*

1. Chapter review questions for each reading assignment
2. In class quizzes for each unit
3. Take home tests for each unit
4. Unit tests for each unit
5. Student notebook (portfolio) for the entire semester. Will contain the record of all student work including assignments and lab work record
6. Laboratory record of each assignment in lab
7. ASE Test Results for the student if taken during the semester
8. Final exam to assess student learning during the semester
   Sample Question:
   Explain the difference between integral and linkage type power steering and the differences in diagnosing problems with each type.

TEXTS AND SUPPLIES

Adopted Text: Auto Suspension and Steering and Shop Manual for Auto Suspension and Steering. Chris Johanson , Goodheart-Willcox Company, 2004

Other Materials: 3" notebook, Safety glasses.

Date Prepared: Fall 1987
Date Reviewed: Spring 1988
Date Reviewed:
PCA Established: Spring 1995

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

Prefix & No. AT 323 Catalog Title Power Trains

Units 5 Weekly lecture hours 3 Weekly lab hours 6 Department Industrial Technology

Credit/No Credit Option

CATALOG DESCRIPTION

An introduction and comprehensive examination of automotive drive lines and differentials; manual transmissions; manual transaxles; automatic transmission fundamentals; flywheel and clutch and 4-wheel drive. Emphasis is placed on principles of operation, troubleshooting and intensive repair.

COURSE GOALS To encourage and enable students to:

1. use technical data.
2. diagnose and overhaul any standard passenger car or light truck, drive line, differential, manual transmission, or clutch.
3. be familiar with 1978 through 1987 power transmission components used in American production cars and popular import passenger cars.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to:

1. diagnose and overhaul four types of drivelines.
2. diagnose and overhaul intregal and removable carrier differentials.
3. diagnose and overhaul a four-speed constant mesh transmission.
4. diagnose and overhaul manual transaxle.
5. diagnose and overhaul a clutch.
6. diagnose and overhaul a four-wheel drive front axle assembly.
7. diagnose and overhaul a four-wheel drive transfer case.
8. service an automatic transmission.
9. make a notebook of all the technical data given for reference purposes

COURSE OUTLINE

		WEEKS
1.	Safety and Hand Tools	1
2.	Drive	2
3.	Differentials and Rear Axles	4
4.	Manual Transmissions	3
5.	Flywheels and Clutches	3
6.	4-wheel drive	2
7.	Automatic Transmission Fundamentals	1

APPROPRIATE READINGS (Other than Textbook)

Appropriate up-to-date factory reference handbooks written on particular model power trains units such as:

1. New Process 208 Transfer Case.
2. Borg Warner T-5 Transmission.
3. Perfection U-joints.
4. Spicer Clutches.

Automotive Service Excellence (ASE) Certification Test Workbook, by James Hughs (drivelines, differentials, standard transmissions, clutch and transaxle units.

ASSIGNMENTS

Sample Assignments:
1. Chapter review questions assigned in alignment with chapter reading assignments.
2. Take home tests prepared by the instructor - multiple choice, true-false, short essay, and fill-in style questions.
3. Assigned lab projects to gain diagnosis and overhaul proficiency.

Essay Example: Describe power flow as it would apply to first gear in a four speed manual transmission.

EVALUATION

1. Gradesheet - all student's grades are recorded on the first page of the notebook.
2. Note Section - accurate and well organized notes are important (50 points grading per notebook).
3. Quizzes - daily quizzes covering all phases of the course (10-30 points each).
4. Unit Tests - multiple choice, true-false, fill-in, and short essay style questions on all material covered in each unit.
5. Take Home Test or Lab Book - homework assign. to prepare student for unit test.
6. Textbook Chapter Review Questions - reinforce learning from reading, lecture and lab work.
7. Job Sheet - listing of lab operations with designated point credit checked off by the instructor to determine actual work done in lab.
8. Extra Credit - consisting of all types of student oriented work in lab or at home.

Sample Test Questions:
1. Draw and label the five types of drivelines.
2. Explain in a step by step procedure how to troubleshoot for a drive line noise or vibration.
3. Draw, label and trace the power flow through a five-speed, overdrive transmission.
4. Draw, label and explain how a posi-trac differential locks both axles together.
5. Draw, label and explain the four types of clutch pressure plates and include the advantages-disadvantages of each.

TEXTS AND SUPPLIES

Adopted Text: Kovacik & Creager, Manual Transmissions & Drive Trains, 1984, Southwestern Publishing Co.

Other Materials:
1. Large ring binder, 10 tab dividers.
2. Safety glasses.
3. Coveralls or shop coat.
4. Possible repair parts for student owned projects.

Date Prepared: Spring 1988
Date Reviewed: Fall 1991
Date Reviewed: Spring 2009
PCA Established: Spring 2009

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **Industrial Technology**

PREFIX & NO.: AT 324

CATALOG/SCHEDULE TITLE: Automatic Transmissions

UNITS: 5

WEEKLY LECTURE HOURS: 3

WEEKLY LAB HOURS: 6

TOTAL NUMBER OF WEEKS: 16

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): AT100

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: *(Students may be prohibited from enrolling based on health and safety issues, or the course is intercollegiate competition, or honors, or includes public performances. State the reason for limiting the enrollment.)*
Must take and pass the Lab Safety Test

ENTRANCE SKILLS *(Must be included if the course has a prerequisite. Entrance skills must come from the instructional objectives of the prerequisite course.)*
The student must have the ability to:

1. Identify general shop safety rules and procedures.
2. Utilize safe procedures for handling tools and equipment.
3. Comply with the required use of safety glasses, gloves, and shoes during lab/shop activities.

CATALOG DESCRIPTION
Designed to make the student proficient in popular automotive transmissions and transaxles, foreign and domestic. Emphasis is on competent repair and troubleshooting of the automatic transmission and transaxles.

SCHEDULE DESCRIPTION
Designed to make the student proficient in popular automotive transmissions and transaxles, foreign and domestic. Emphasis is on competent repair and troubleshooting of the automatic transmission and transaxles.

COURSE GOALS:
To encourage and enable students to:

1. Use automatic transmission and transaxle technical data from all available sources.
2. Troubleshoot service procedures for automatic transmissions and transaxles.
3. Be confident in automatic transmission and transaxle repairs.
4. Learn the power flow through automatic transmissions and transaxles.
5. Become proficient in servicing any type of automatic transmission and transaxle.

INSTRUCTIONAL OBJECTIVES:
At the end of the course, the student will demonstrate the ability to:

1. Perform assignments using technical reference data.
2. Troubleshoot automatic transmission and transaxle problems and failures.
3. Overhaul an automatic transmission.
4. Overhaul an automatic transaxle.
5. Service several automatic transmissions and transaxles.
6. Bench and dynamometer test and apply theoretical principles to automatic transmissions.
7. Be prepared to pass the ASE A2 test.

OUTLINE OF COURSE CONTENT AND SCOPE *(Indicate all major topics to be covered and approximate number of weeks for each, based on 16 weeks)*

	WEEKS
1. Safety, Hand Tools, Special Tools Class Procedure	1
2. Automatic Transmission and Transaxle Fundamentals	3
3. Troubleshooting Mechanical, Hydraulic, and Electrical Problems	2
4. Troubleshooting Electronic Control System Problems	1
5. Transmission and Transaxle In-Vehicle Service	1
6. Transmission and Transaxle Removal	1
7. Transmission and Transaxle Rebuilding	1
8. ASE Test Preparation	5
	1

APPROPRIATE READINGS *(Other than Textbook)*
Articles and excerpts from trade sources as assigned.

OUTSIDE ASSIGNMENTS *Two hours of outside work is required for every one lecture hour. For courses 16 hours or less, the outside assignments may be completed independently by the student during or after the time scheduled for the class. (Samples of outside assignments must be reflected in this portion of the outline.) Give types of assignments and one example of a specific writing assignment.*

1. Read and be prepared to discuss each chapter in the text.
2. Complete the review questions at the end of each chapter prior to the lecture on that topic.
3. Preview each of the laboratory assignments in the shop manual prior to the topic being covered in the laboratory demonstration.
4. Read and be prepared to discuss any handouts prior to the next meeting.

EVALUATION *Describe the methods by which students and instructors will know how the objectives listed above have been met. (Give types of instruments used for purposes of evaluation and at least one specific example of an essay question requiring the student to think independently and write).*

1. Chapter review questions for each reading assignment
2. In class quizzes for each unit
3. Take home tests for each unit
4. Unit tests for each unit
5. Student notebook (portfolio) for the entire semester will contain the record of all student work including assignments and lab work record
6. Laboratory record of each assignment in lab
7. Student ASE A2 Test results may be substituted for the final exam if the testing is completed during the semester.
8. Final exam to assess student learning during the semester.
   Sample Question:
   Explain how the modulator controls shift points in a hydraulically controlled transmission and in an electronically controlled transmission.

TEXTS AND SUPPLIES

Adopted Text: Automatic Transmission & Transaxles, Johanson
G-W Publishing
Text and Shop Manual set
Copyright 2005
Edition 02
ISBN 9781590708514

Other Materials: 3" notebook, Safety glasses.

Date Prepared: Spring 1988
Date Reviewed: Fall 1991
Date Reviewed: _____
PCA Established: _____

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

Prefix & No. AT 324 Catalog Title Automatic Transmission

Units 5 Weekly lecture hours 3 Weekly lab hours 6 Department Industrial Technology

Credit/No Credit Option

Catalog Prerequisites: AT 100 or equivalent.

CATALOG DESCRIPTION

Designed to make the student proficient in four popular automotive transmissions: G.M., Ford, Chrysler, and foreign. Emphasis is on competent repair and troubleshooting of the automatic transmission.

COURSE GOALS: To encourage and enable students to

1. use automatic transmission technical data plus service manuals.
2. troubleshoot service procedures for automatic transmissions.
3. be confident in automatic transmission repairs.
4. learn the power flow through a three- and four-speed automatic transmissions using the Simpson train.
5. become proficient in servicing any type of automatic transmission.

INSTRUCTIONAL OBJECTIVES: At the end of the course, students will demonstrate the ability to

1. perform assignments using technical reference data.
2. troubleshoot automatic transmission problems and failures.
3. overhaul a turbo-hydromatic automatic transmission.
4. overhaul a three-speed automatic transmission for the Ford cruiso-matic family, turbo-hydro type, turqueflite family, and a foreign transmission.
5. service several 1980 to 1988 automatic transmissions.
6. bench test and apply theoretical principles to automatic transmissions.

COURSE OUTLINE

WEEKS

1. Safety, Hand Tools, Special Tools — 1
   A. class procedure
   B. laboratory tour, auto facility's future plans
   C. cleanup procedure
   D. safety lesson and test
2. Auto Trans Fundamentals — 4
   A. mechanical operation
   B. hydraulic operation
   C. torque converters and fluid couplings
   D. troubleshooting
3. Turbo Hydromatics and Hydromatics — 6
   A. mechanical operation
   B. hydromatic operation
   C. repair, R & R, and adjust
   D. troubleshooting
4. Fordomatics — 5
   A. mechanical operation
   B. hydromatic operation
   C. repair, R & R, adjust
   4. troubleshooting
5. Torque Flite — 2
   A. mechanical operation
   B hydromatic operation
   C. repair, R & R, adjust
   D. troubleshooting

APPROPRIATE READINGS (Other than Textbook)

1. Motor Age Magazine (training program) articles, distributed by Instructor.
2. Motor Magazine, special articles, distributed by Instructor.
3. Assorted articles, automatic transmission oriented, distributed by Instructor.

ASSIGNMENTS

1. Take Home Tests: one for each unit (5 total) approximately 75 to 100 questions, due on unit test date, covering lecture, lab demonstrations and lab exercises.
2. Chapter Review Questions: one set for each unit. Questions extracted from the reading assignments to encourage reading the assignments.
3. Take Home Quizzes: Three to nine per unit of study. Ten to thirty points each covering outside reading, lecture quizzes and state exam preparation.

4. Early Bird Exams: Three to twelve per unit of study, given at opening of each class. Covering lecture, demonstrations and readings or state/national exam preparation.
5. Unit Test: one per unit. To sum up all work done on that unit of study. All homework (chapter review questions, take home tests) due on this date.

EVALUATION (The methods by which students and instructors will know how the objectives listed above have been met.)

Evaluation of student achievement is based on a point system - 1/3 of which is comprised of lecture, demonstrations, and testing, 1/3 homework, and 1/3 lab work. The student can earn a passing grade by excelling in any one of the three areas; an excellent grade will be given to students excelling in all three areas. Evaluation of student is by use of the notebook method. The notebook consists of:

1. Gradesheet - all students' grades are recorded on the first page of the notebook.
2. Note Section - accurate and well organized notes are important (30 points grading per notebook).
3. Quizzes - daily quiz covering all three quizzes of the course are given unannounced (10-30 points each).
4. Take Home Test or Lab Book - homework assignments to prepare student for unit test (30 points each).
5. Textbook Chapter Review Questions - reenforce learning from reading, lecture and lab work (each set per unit is 30 points).
6. Job Sheet - listing of lab operations with designated point credit checked off by instructor to determine actual work is done in lab.
7. Mid-term Project (50-100 points each).
8. Extra Credit - consisting of all types of student oriented work in lab or at home (5-100 points, 500 point limit).

TEXTS AND SUPPLIES

Adopted text: Chek Charts Automatic Transmissions. Canfield Press. Division of H.M. Gousha Co.

Other Materials: 1. Ford Motor Company Transmission Booklets to be identified by instructor.

2. Safety glasses.
3. Work shoes.
4. Uniforms.
5. Notebook.

2013-2014

Date Prepared: Fall 1986
Date Reviewed: Fall 2013
Date Reviewed:
PCA Established: Fall 2013
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology
Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: **Industrial Technology**

PREFIX & NUMBER: AT 334

CATALOG COURSE TITLE: Automotive Machining 1

BANNER COURSE TITLE: Automotive Machining 1

UNITS: 4

TOTAL NUMBER OF CONTACT HOURS: 96-108

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3	48 - 54	3
Lab:	3	48 - 54	1
Total Contact Hours:	6	96 - 108	4

GRADING OPTION: Letter Grade Only

PREREQUISITE(S): AT 133

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
Must take and pass the Lab Safety Test.

PREREQUISITE SKILLS (*The course outline must document entry skills without which student*

success is highly unlikely. Must be included if the course has a prerequisite.)

Upon entering this course, the student should be able to:

1. Function in safe manner in an automotive repair facility
2. Correctly deal with hazardous materials encountered in the repair of an automotive engine.
3. Perform precision measurement and know the proper care and operation of precision measurement tools.
4. Be familiar with all of the machine processes for engine remanufacturing.
5. Locate, evaluate and use the proper information sources needed in the engine rebuilding process.
6. Identify engine cycles, types, construction and components.
7. Perform the proper diagnostic tests, evaluate the results, determine the most likely cause for the defect and the proper course of action to repair the defect.
8. Compare existing component dimensions and condition to specified dimensions and condition and determine the correct course of action.
9. Remove and replace a vehicle's engine.
10. Remove and replace a defective engine component.

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*

Upon entering this course, the advisory skills are to:

None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

An intensified course in automotive machining, the course will emphasize student proficiency in machine operation. Designed to make the student proficient in all phases of automotive and industrial engine rebuilding, including crankshaft grinding, boring, honing, line boring, block and head resurfacing, crack repair, head reconditioning, precision measuring, balancing, and engine assembly.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Shop Safety and Environmental Protection.	1
2. Tools and equipment and precision measurement	2
3. Milling, grinding and surfacing machines	2
4. Engine inspection, crack detection and repair	1
5. Valve train and cylinder head machining	2
6. Engine block machining	2
7. Rotating assembly machining	2
8. Engine balancing	1
9. Engine assembly and break-in	1
10. Introduction to performance engine building	2

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. Use all technical data resources.
2. Bore, hone and fit pistons in cylinders blocks.
3. Perform a 3 angle valve job.
4. Recondition rods.
5. Crack inspect with a bench dry power method and a magnaflux.
6. Surface a flywheel facing, turn a drum and turn a disc.
7. Press bearings with a table press.
8. Surface heads and block.
9. Assemble an engine.
10. Balance rotating assemblies.
11. Grind and polish crankshafts.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Lecture presentations and classroom discussions. 2. Instructor-guided individual and group projects on vehicles and simulators in the laboratory.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required*

texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)

Outside Assignments
1. Read and be prepared to discuss each chapter in the text. 2. Complete the review questions at the end of each chapter prior to the lecture on that topic. 3. Preview each of the laboratory assignments in the shop manual prior to that topic being covered in the laboratory demonstration. 4. Read and be prepared to discuss any handouts prior to the next meeting.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Chapter Review Questions for each reading assignment. 2. In Class Quizzes for each unit. 3. Unit Tests for each unit. 4. Student Notebook (Portfolio) for the entire semester. Will contain the record of all student work including assignments and lab work record. 5. Laboratory Record of each assignment in lab. 6. AERA Test Results for the student if taken during the semester. 7. Final Exam to assess student learning outcomes during the semester.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: Engine Service - Automotive Machining and Engine Repair, Gary Lewis, 2006
Note: This book is the recommended by AERA, the Automotive Engine Builders Association, www.aera.org

Supplemental Readings and/or Other Materials: Articles and excerpts from trade sources as assigned.

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Identify safe and unsafe procedures for machining components in the automobile.
2. Identify where to find the correct procedures and specifications for the mechanical repair of automotive engine and its related components.
3. Explain the proper procedure for using the tools involved in the mechanical repair of the automotive engine and its related components.
4. Describe the proper procedure for diagnosing mechanical problems with the automotive engine and its related components.
5. Demonstrate the ability to properly use the tools involved in the mechanical repair of the automotive engine and its components.
6. Diagnose mechanical problems with the automotive engine.
7. Demonstrate the ability to work on automotive engines with accuracy, dependability, proficiency and in a timely and safe manner.
8. Demonstrate the ability to work independently and in groups to service, repair, test, and maintain the mechanical systems of the automotive engines.
9. Demonstrate the ability to work independently and in groups to service, repair, test, and maintain the mechanical systems of the automotive engines.
10. Demonstrate the ability to meet employer expectations for employees within the automotive machining shop.

2013-2014

Date BOT Approved: Dec. 10, 2013
Date Reviewed: _____
Date Reviewed: _____
PCA Established: Fall 2013
Date DL Conversion Approved _____

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology
Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: **Industrial Technology**

PREFIX & NUMBER: AT 336

CATALOG COURSE TITLE: Automotive Machining 2

BANNER COURSE TITLE: Automotive Machining 2

UNITS: 4

TOTAL NUMBER OF CONTACT HOURS: 96-108

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3	48 - 54	3
Lab:	3	48 - 54	1
Total Contact Hours:	6	96 - 108	4

GRADING OPTION: Letter Grade Only

PREREQUISITE(S): AT 334

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
Must take and pass the Lab Safety Test.

PREREQUISITE SKILLS *(The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*

Upon entering this course, the student should be able to:

1. Use all technical data resources.
2. Bore, hone and fit pistons in cylinders blocks.
3. Perform a 3 angle valve job.
4. Recondition rods.
5. Crack inspect with a bench dry power method and a magnaflux.
6. Surface a flywheel facing, turn a drum and turn a disc.
7. Press bearings with a table press.
8. Surface heads and block.
9. Assemble an engine.
10. Balance rotating assemblies.
11. Grind and polish crankshafts.

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*

Upon entering this course, the advisory skills are to:

None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

An advanced course focused on precision and performance engine preparation. Topics to be covered include engine components selection, machining and measurement for maximum engine efficiency and output.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on 16 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Shop Safety and Environmental Protection.	1
2. Tools and equipment used in engine output measurement	1
3. Formulas for gas flow, compression ratios, cylinder pressures torque, net	2

output (horsepower) and fuel consumption.	1
4. Introduction to fuel chemistry and fuel combustion.	1
5. Flow bench operation	1
6. Valve train and cylinder head machining for optimized engine efficiency	1
and output.	1
7. Engine block machining for optimized engine efficiency and output.	1
8. Rotating assembly machining for optimized engine efficiency and output.	1
9. Engine balancing for optimized engine efficiency and output.	1
10. Engine assembly for optimized engine efficiency and output.	1
11. Engine dynamometer testing	2
12. Engine Blueprinting	1

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. Use precision measuring instruments in engine machining and in the evaluation of engine component performance and output.
2. Locate, evaluate and use information from various sources in the course of evaluating engine performance and efficiency.
3. Apply formulas for gas flow, compression ratios, cylinder pressures torque, net output (horsepower) and fuel consumption for the purpose of evaluating engine performance and efficiency.
4. Select engine fuels for optimized engine efficiency and output.
5. Machine an engine to optimize engine efficiency and output.
6. Assemble an engine to optimize engine efficiency and output.
7. Diagnose and correct engine problems that prevent optimized engine efficiency and output.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Lecture presentations and classroom discussions.
2. Instructor-guided individual and group projects on vehicles and simulators in the laboratory.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1. Read and be prepared to discuss each chapter in the text. 2. Complete the review questions at the end of each chapter prior to the lecture on that topic. 3. Preview each of the laboratory assignments in the shop manual prior to that topic being covered in the laboratory demonstration. 4. Read and be prepared to discuss any handouts prior to the next meeting.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Chapter Review Questions for each reading assignment. 2. In Class Quizzes for each unit. 3. Unit Tests for each unit. 4. Student Notebook (Portfolio) for the entire semester. Will contain the record of all student work including assignments and lab work record. 5. Laboratory Record of each assignment in lab. 6. AERA Test Results for the student if taken during the semester. 7. Final Exam to assess student learning outcomes during the semester.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: Engine Service - Automotive Machining and Engine Repair, Gary Lewis, 2006
Note: This book is the recommended by AERA, the Automotive Engine Builders Association, www.aera.org

Supplemental Readings and/or Other Materials: Articles and excerpts from trade sources as assigned.

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Identify safe and unsafe procedures used in the course of engine output measurement.
2. Identify where to find the correct procedures and specifications for the machining and measurement of engines.
3. Explain the proper procedure for using the tools involved in engine output measurement.
4. Describe the proper procedure for diagnosing mechanical problems with the automotive engine that prevent optimized engine efficiency and output.
5. Demonstrate the ability to properly use the tools involved in engine output measurement.
6. Demonstrate the ability to prepare and measure engines for optimized efficiency and output with accuracy, dependability, proficiency and in a timely and safe manner
7. Demonstrate the ability to work independently and in groups to prepare and measure engines for optimized efficiency and output.
8. Demonstrate the ability to meet employer expectations for employees within the trade.

Date Prepared: Spring 1998
Date Reviewed: Fall 1991
Date Reviewed: Spring 2011
PCA Established:
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: AT 341

CATALOG/SCHEDULE TITLE: Fuel Injection/Turbocharging

UNITS: 5

TOTAL NUMBER OF CONTACT HOURS: 144-162

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3	48-54	3
Lab:	6	96-108	2
Total Contact Hours:	9	144-162	5

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): AT 303, or concurrent enrollment in AT 303, or high school automotive electrical study.

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability to meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course has a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS (*For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the student should be able to:
1. Analyze, evaluate and solve electrical system faults using Ohm's law.
2. Perform battery, starting, and charging system tests, analyze the results and perform all

required repairs.
3. Analyze, evaluate and repair automotive wiring and accessory circuit problems using wiring diagrams.

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

This course provides theory and application of automotive fuel supply and fuel injection systems. The course includes basic engine, fuel supply, fuel injection, turbocharging, and computerized engine controls diagnosis and repair.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on 16 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Minor engine performance diagnosis and adjustments	2
2. Emission standards and testing	1
3. Engine condition diagnosis	1
4. Fuel supply systems and diagnosis	2
5. Fuel injection systems and operation	3
6. Fuel injection diagnosis and service	2
7. Intake and exhaust systems, and turbocharging	2
8. Computerized engine controls and OBDII	2
9. Catalytic converters	1

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. Analyze engine performance and fuel systems complaints using technical data.
2. Analyze and perform repairs on fuel system related problems using scan tools and engine performance special tools.
3. Analyze and repair fuel storage and supply systems.
4. Perform on-car engine performance adjustments.
5. Diagnose, evaluate and repair fuel injection and turbocharging systems as applied to late model Domestic, Asian, and European vehicles

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

	Methods of Instruction
1. Analyze engine performance and fuel systems complaints using technical data. 2. Analyze and perform repairs on fuel system related problems using scan tools and engine performance special tools. 3. Analyze and repair fuel storage and supply systems. 4. Perform on-car engine performance adjustments. 5. Diagnose, evaluate and repair fuel injection and turbocharging systems as applied to late model Domestic, Asian, and European vehicles	1. Lecture presentations and classroom discussions. 2. Video and audio presentations followed by group discussions. 3. Instructor guided lab demonstrations.

ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

	Assignments
1. Analyze engine performance and fuel systems complaints using technical data. 2. Analyze and perform repairs on fuel system related problems using scan tools and engine performance special tools. 3. Analyze and repair fuel storage and supply systems. 4. Perform on-car engine performance adjustments. 5. Diagnose, evaluate and repair fuel injection and turbocharging systems as applied to late model Domestic, Asian, and European vehicles	1. Readings from appropriate sections of the textbook. 2. Complete end of chapter questions. Format will be written answers and multiple choice. 3. Locate technical data using Mitchell on-demand and All-Data information systems. 4. Complete NATEF A-8 on-car lab assignments as required for fuel and related systems.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

	Methods of Evaluation
1. Analyze engine performance and fuel systems complaints using technical data. 2. Analyze and perform repairs on fuel system related problems using scan tools	1. Completed chapter review and quiz questions. 2. In class quizzes. 3. In class unit tests.

and engine performance special tools. 3. Analyze and repair fuel storage and supply systems. 4. Perform on-car engine performance adjustments. 5. Diagnose, evaluate and repair fuel injection and turbocharging systems as applied to late model Domestic, Asian, and European vehicles	4. Lab task assignments. 5. Final exam.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: James Halderman, Jim Linder
Automotive Fuel and Emissions Control Systems (class and lab manual set) 3rd edition, Pearson-Prentice Hall, 2012

Other Materials: Safety glasses
Shop coat or coveralls
Notebook and tab dividers

Date Prepared: Fall 1987
Date Reviewed: Spring1998
Date Reviewed: Fall 1990
Date Reviewed: Spring 2011
PCA Established: Fall 1996
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: AT 343

CATALOG/SCHEDULE TITLE: Engine Performance/Diagnosis

UNITS: 5

TOTAL NUMBER OF CONTACT HOURS: 144-162

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3	48-54	3
Lab:	6	96-108	2
Total Contact Hours:	9	144-162	5

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): AT 341 or prior basic engine performance and fuel system training

LIMITATION ON ENROLLMENT:
None

PREREQUISITE SKILLS
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the student should be able to:
1. Analyze and perform repairs on fuel system related problems using scan tools and engine performance special tools.
2. Perform on-car engine performance adjustments.
3. Analyze and repair fuel storage and supply systems.

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

This course is designed to give students a basic knowledge of engine diagnostic tools, and a working ability to diagnose engine performance problems. The course includes fuel, ignition, computerized engine controls, and emission controls related systems.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on 16 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Minor tune-up and diagnosis	2
2. Emission standards and testing	1
3. Engine condition diagnosis	1
4. Ignition systems	3
5. Ignition oscilloscopes and graphing meters	1
6. Ignition system diagnosis	2
7. Symptom based diagnosis	1
8. Computerized engine controls	3
9. Sensors and actuators	2

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. Analyze engine performance faults using technical data.
2. Analyze and repair ignition faults using a scan tool and digital storage oscilloscope.
3. Perform ignition and fuel system adjustments.
4. Analyze and repair solid state ignition systems including enhanced and distributor ignition systems.
5. Diagnose common computerized engine control system faults and perform required repairs.
6. Verify and repair engine performance complaints using common road test, scan tool, and scope testing methods.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction	
1. Analyze engine performance faults using technical data. 2. Analyze and repair ignition faults using a scan tool and digital storage oscilloscope. 3. Perform ignition and fuel system adjustments. 4. Analyze and repair solid state ignition systems including enhanced and distributor ignition systems. 5. Diagnose common computerized engine control system faults and perform required repairs. 6. Verify engine performance complaints through road, scan tool and scope testing. Interpret the results and perform necessary repairs.	1. Lecture presentations and classroom discussions. 2. Video and audio presentations followed by group discussions. 3. Instructor guided lab demonstrations.

ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Assignments	
1. Analyze engine performance faults using technical data. 2. Analyze and repair ignition faults using a scan tool and digital storage oscilloscope. 3. Perform ignition and fuel system adjustments. 4. Analyze and repair solid state ignition systems including enhanced and distributor ignition systems. 5. Diagnose common computerized engine control system faults and perform required repairs. 6. Verify engine performance complaints through road, scan tool and scope testing. Interpret the results and perform necessary repairs.	1. Readings from appropriate sections of the textbook. 2. Complete end of chapter questions. Format will be written answers and multiple choice. 3. Locate technical data using Mitchell on-demand and All-Data information systems. 4. Complete NATEF A-8 on-car lab assignments as required for engine performance and related systems.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

	Methods of Evaluation
1. Analyze engine performance faults using technical data. 2. Analyze and repair ignition faults using a scan tool and digital storage oscilloscope. 3. Perform ignition and fuel system adjustments. 4. Analyze and repair solid state ignition systems including enhanced and distributor ignition systems. 5. Diagnose common computerized engine control system faults and perform required repairs. 6. Verify engine performance complaints through road, scan tool and scope testing. Interpret the results and perform necessary repairs.	1. Completed chapter review and quiz questions. 2. In class quizzes. 3. In class unit tests. 4. Lab task assignments. 5. Final exam.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: James Halderman, Jim Linder
Automotive Fuel and Emissions Control Systems (class and lab manual set) 3rd edition, Pearson-Prentice Hall, 2012

Other Materials: Safety glasses
Shop coat or coveralls
Notebook and tab dividers

Date Prepared: Fall 1996
Date Reviewed: Fall 1998
Date Reviewed: Spring 2011
PCA Established: Fall 1996
Date DL Conversion Approved _____

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: AT 344

CATALOG/SCHEDULE TITLE: Emission Control/BAR CAC

UNITS: 4

TOTAL NUMBER OF CONTACT HOURS: 96-108

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3	48-54	3
Lab:	3	48-54	1
Total Contact Hours:	6	96-108	4

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): AT 341 and AT 343

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability to meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course has a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS (*For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the student should be able to:
AT 341 Course 1. Analyze engine performance faults using technical data.
2. Perform engine performance diagnosis and adjustments.
3. Understand fuel injection system operation and diagnostic methods.

AT 343 Course 1. Diagnose common computerized engine control system faults and perform required repairs.
2. Verify engine performance complaints through road, scan tool and scope testing. Interpret the results and perform necessary repairs.

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

This course provides theory and diagnosis of automotive emission control systems. The course includes the BAR (Bureau of Automotive Repair) CAC (Clean Air Car) course preparation and certification.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on 16 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Smog check rules and regulations	2
2. BAR EIS emission analyzer	1
3. Basic area inspection procedures	2
4. Station and technician licensing	2
5. Emission control devices	3
6. Computerized engine controls and OBDII	2
7. Repair, retest, and inspection scenarios	1
8. BAR bi-annual updates	3

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. Interpret Bureau of Automotive repair smog check rules and regulations.
2. Use technical data to identify vehicle emission control system applications.
3. Perform vehicle emission control system device visual and functional inspections.
4. Perform complete vehicle smog check inspections in the training mode.
5. Develop computerized engine controls system operation and diagnostic skills.
6. Apply BAR update training skills in the lab on training vehicles.
7. Prepare for and complete all required Clean Air Car Course certification exams.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to*

choose how they will achieve course objectives.)

Methods of Instruction	
1. Interpret Bureau of Automotive repair smog check rules and regulations. 2. Use technical data to identify vehicle emission control system applications. 3. Perform vehicle emission control system device visual and functional inspections. 4. Perform complete vehicle smog check inspections in the training mode. 5. Develop computerized engine controls system operation and diagnostic skills. 6. Apply BAR update training skills in the lab on training vehicles. 7. Prepare for and complete all required Clean Air Car Course certification exams.	1. Lecture presentations and classroom discussions. 2. Video and audio presentations followed by group discussions. 3. Instructor guided lab demonstrations, and on-car tasks.

ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

	Assignments
1. Interpret Bureau of Automotive repair smog check rules and regulations. 2. Use technical data to identify vehicle emission control system applications. 3. Perform vehicle emission control system device visual and functional inspections. 4. Perform complete vehicle smog check inspections in the training mode. 5. Develop computerized engine controls system operation and diagnostic skills. 6. Apply BAR update training skills in the lab on training vehicles. 7. Prepare for and complete all required Clean Air Car Course certification exams.	1. Readings from appropriate sections of the textbook. 2. Complete end of chapter questions. Format will be written answers and multiple choice. 3. Locate technical data using Mitchell on-demand and All-Data information systems. 4. Complete NATEF A-8 on-car lab assignments as required for emission control and related systems.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

	Methods of Evaluation
1. Interpret Bureau of Automotive repair smog check rules and regulations. 2. Use technical data to identify vehicle emission control system applications. 3. Perform vehicle emission control system device visual and functional inspections. 4. Perform complete vehicle smog check inspections in the training mode. 5. Develop computerized engine controls system operation and diagnostic skills. 6. Apply BAR update training skills in the lab on training vehicles. 7. Prepare for and complete all required Clean Air Car Course certification exams.	1. Completed chapter review and quiz questions. 2. In class quizzes. 3. In class unit tests. 4. Lab task assignments. 5. Final exam.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: James Halderman, Jim Linder
Automotive Fuel and Emissions Control Systems (class and lab manual set) 3rd edition, Pearson-Prentice Hall, 2012
BAR Smog check reference guide 12/09
BAR Smog check inspection procedures manual 12/09
BAR Basic Clean Air Car Course student workbook 9/0

Other Materials: Safety glasses
Shop coat or coveralls
Notebook and tab dividers

Date BOT Approved: June 2011
Date Reviewed: _____
Date Reviewed: _____
PCA Established: _____
Date DL Conversion Approved _____

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology
Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: **INDUSTRIAL TECHNOLOGY**

PREFIX & NUMBER: AT 379 B

CATALOG/SCHEDULE TITLE: Ford Powerstroke Diesel

UNITS: 1

TOTAL NUMBER OF CONTACT HOURS: 24-27

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	1	16-18	1
Lab:	.5	8-9	
Total Contact Hours:	1.5	24-27	1

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): AT343

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability to meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course has a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS (*For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the student should be able to:
Understand basic engine performance systems and diagnosis.

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

This course includes operation, diagnosis, and repair of Ford Powerstroke Diesel engine performance systems

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
Introduction and explanation of the beginning of the powerstroke diesel engine from 1994.5 High pressure oil systems and components High pressure fuel systems Changes and updates to the 7.3L engine 1994.5-2003	8
Introduction to the 6.0L engine High pressure oil systems and components High pressure fuel systems Exhaust and air inlet Changes and updates from 2003-2007	6
Introduction to the 6.4L engine	2

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. Describe Ford powerstroke diesel engine control systems.
2. Diagnose Ford powerstroke diesel engine control systems.
3. Repair Ford powerstroke diesel engine control systems.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction	
1. Describe Ford powerstroke diesel engine control systems. 2. Diagnose Ford powerstroke diesel	1. Lecture presentations and classroom discussions. 2. Video and audio presentations

engine control systems. 3. Repair Ford powerstroke diesel engine control systems.	followed by group discussions. 3. Instructor guided lab demonstrations, and on vehicle tasks.

ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Assignments	
1. Describe Ford powerstroke diesel engine control systems. 2. Diagnose Ford powerstroke diesel engine control systems. 3. Repair Ford powerstroke diesel engine control systems.	1. Reading from appropriate sections of the textbook. 2. Complete end of chapter questions. 3. Locate technical data using Mitchell on demand or All-data information systems.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation	
1. Describe Ford powerstroke diesel engine control systems. 2. Diagnose Ford powerstroke diesel engine control systems. 3. Repair Ford powerstroke diesel engine control systems.	1. Complete chapter review questions. 2. In class quiz score results. 3. In class unit test results. 4. Lab tasks assignment completion. 5. Final exam.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: Ford Powerstroke Manual

Other Materials: Class handouts

Date BOT Approved: _____
Date Reviewed: Fall 2013
Date Reviewed: _____
PCA Established: _____
Date DL Conversion Approved _____

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Automotive Technology

DEPARTMENT: **INDUSTRIAL TECHNOLOGY**

PREFIX & NUMBER: AT 389

CATALOG COURSE TITLE: Independent Projects in Automotive Technology

BANNER COURSE TITLE: **INDEPENDENT PROJECTS**

UNITS: 1-3

TOTAL NUMBER OF CONTACT HOURS: 48-144 - 54-162

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	0	0 - 0	0
Lab:	3-9	48-144 - 54-162	1-3
Total Contact Hours:	3-9	48-144 - 54-162	1-3

GRADING OPTION: Letter Grade Only

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the advisory skills are to:
None (no advisory for this course)

CATALOG DESCRIPTION
The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

AT 389 Independent Projects is for students capable of independent work who demonstrate the need or desire for additional study beyond the regular curriculum. Enrollment allows students to pursue activities such as directed field experience, search or development of skills and competencies under faculty advisement and supervision.

Students wishing to enroll in AT 389 Independent Projects should contact the appropriate instructor identified in the class schedule. If the project proposed is acceptable to that instructor, a contract will be issued no later than the end of the second week of the semester.

Units are awarded depending upon satisfying performance and the amount of time committed by the students to the course. Allowable units vary according to discipline, and are based on the following formula:

1 unit - 48 hours per semester
2 units - 96 hours per semester
3 units - 144 hours per semester

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Introduction	1
2. Defining student responsibility	1
3. Establishing project and procedures	1
4. Individual student work to fit particular problem	12
5. Summary and critiques	1

COURSE OBJECTIVES:
At the end of the course, the student will be able to:
1. Plan and submit for instructional approval an independent project.
2. Gather data, research, evaluate, and use appropriate information to complete contractual project.
3. Assume responsibility for meeting set deadlines, and completing project.
4. Evaluate project for completeness, clarity, and presentation.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
Instruction will vary depending on content for the project.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
Assignments will vary depending on content of the project

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
Means for evaluation will be worked out between the individual student and the instructor, or will be stated on the course outline of Independent Projects for the specific discipline.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: Text, if any, will vary depending on the content of project.

Supplemental Readings and/or Other Materials:	Other materials, if any, will vary depending on content of project. Appropriate readings will vary depending on the content for the project.

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Plan and submit for instructional approval an independent project.
2. Gather data, research, evaluate, and use appropriate information to complete contractual project.
3. Assume responsibility for meeting set deadlines, and completing project.
4. Evaluate project for completeness, clarity, and presentation.

Attachment 10

Plan For Future Course Scheduling in Automotive Technology

For many years the Tune Up and Emissions courses have been offered day and evenings with the classes being staggered so that evening students were one semester ahead of the day students. This allows for a student who can only either attend days or nights to complete those courses in 2 years (AT 303, 341, 343 and 344). This makes it difficult to finish the certificate in one year but it can be done by attending both day and evenings. Due to faculty availability many of the other course were only offered days or evenings.
Beginning Fall of 15 all of the courses will be offered either day or evenings in a 2 year cycle. Below is a comparison of the previous schedule and the new schedule.

	Day	Evening		Day	Evening
Fall 15	AT 100 X 4	AT 100 X 2	Fall 12	AT 100	AT 100 X 2
	AT 303	AT 133		AT 133	AT 306
	AT 323	AT 313		AT 303	AT 323
	AT 336	AT 343		AT 313	AT 343
	AT 341			AT 341	
Spring 16	AT 100 X 4	AT 100 X 2	Spring 13	AT 100 X 2	AT 100 X 2
	AT 303	AT 314		AT 303	AT 306
	AT 306	AT 334		AT 314	AT 324
	AT 324	AT 344		AT 334	AT 341
	AT 343			AT 343	
Summer 16	AT 314	AT100	Summer 13		AT 100
Fall 16	AT 100 X 4	AT 100 X 2	Fall 13	AT 100 X 2	AT 100 X 2
	AT 133	AT 303		AT 133	AT 306
	AT 303	AT 323		AT 303	AT 323
	AT 313	AT 336		AT 313	AT 343
	AT 341			AT 341	
Spring 17	AT 100 X 4	AT 100 X 2	Spring 14	AT 100 X 2	AT 100 X 2
	AT 303	AT 306		AT 303	AT 306
	AT 324	AT 314		AT 314	AT 324
	AT 334	AT 341		AT 334	AT 344
	AT 343	AT 344		AT 343	

In addition impacted classes that nearly always have a waiting list will be offered in the summer semesters. This will create a greater need for more qualified faculty but will increase the student access to courses and completions. This will also require closer coordination with counseling in developing E.P. for students.

The ideal solution would be offerings both day and evenings but this is not possible without additional full time faculty.

Attachment 11

Example Student Schedule for Degrees and Certificates

		AUTO SERVICE MANAGEMENT (A.S.)		AUTO TUNE-UP AND DIAGNOSTIC PROCEDURES (A.S.)		AUTO ENGINE REBUILDING (A.S.)		AUTOMOTIVE CHASSIS (A.S.)		TUNE-UP EMISSION CONTROL SPECIALIST - Certificate of Achievement		ENGINE, POWER TRAINS SPECIALIST- Certificate of Achievement
	AT 100 Automotive Fundamentals	4	AT 100 Automotive Fundamentals	4	AT 100 Automotive Fundamentals	4	AT 100 Automotive Fundamentals	4	AT 100 Automotive Fundamentals	4	AT 100 Automotive Fundamentals	4
Fall	BUS 104 Business Organization & Management	3	AT 133 Automotive Engine Rebuilding	5	AT 133 Automotive Engine Rebuilding	5	AT 303 Automotive Electricity	5	AT 133 Automotive Engine Rebuilding	5	AT 133 Automotive Engine Rebuilding	5
	BUS 107 Human Relations in Business	3	AT 303 Automotive Electricity	4	AT 323 Power Trains	5	AT 313 Automotive BrakeS	4	AT 303 Automotive Electricity	4	AT 313 Automotive BrakeS	4
	AT 300 Industrial Math Shop Math and Measurement	3	AT 341 Automotive Carburetion/Injection	5	MT 109 Survey of Machining	4	AT 323 Power Trains	5	AT 341 Automotive Carburetion/Injection	5	AT 323 Power Trains	5
	AT 133 Automotive Engine Rebuilding	5										
	Semester total units	14		14		14		14		14		14
Spring	AT 133 Automotive Engine Rebuilding	5	AT 343 Automotive Tune-Up and Engine Analysis	5	AT 334 Automotive Machining	4	AT 314 Suspension and Alignment	4	AT 343 Automotive Tune-Up and Engine Analysis	5	AT 324 Automatic Transmissions	5
	AT 303 Automotive Electricity	5	AT 324 Automatic Transmissions	5	AT 108 Print Reading and Interpretation	3	AT 324 Automatic Transmissions	5	AT 324 Automatic Transmissions	5	AT 314 Suspension and Alignment	4
	AT 314 Suspension and Alignment	4	AT 389 Independent Projects in Automotive Technology 1-3	2	AT 324 Automatic Transmissions	5	AT 341 Fuel Injection/Turbocharging	5	AT 389 Independent Projects in Automotive Technology 1-3	2	AT 303 Automotive Electricity	4
	Semester total units	14		12		12		14		12		13
	Major Units total	32		30		30		32		30		31

AUTO BODY REFINISHING (Certificate of Accomplishment)

The graduate of the certificate program in auto body refinishing will:

- Develop, practice and apply good work and safety habits while in the auto body workplace.
- Determine processes and materials needed to refinish vehicle surfaces in accordance with collision industry standards.
- Demonstrate commercially acceptable skills and speed in refinishing vehicles.
- Understand the basic theory of auto body metal repair and plastic filler application.
- Develop occupational skills including team work, work habits, ethics and communication skills.
- Identify estimating processes used in the collision industry.

A total of 15 units is required for the certificate.

COURSE NUMBER	TITLE	UNITS
AB 351	Auto Body - Metal	3
AB 354	Selected Auto Body Paint Projects	1
AB 356	Automotive Painting Techniques	3
AB 358	Automotive Refinishing	3
AB 360	Collision and Painting Repairs	5

AUTOMOTIVE TECHNOLOGY: AUTO SERVICE MANAGEMENT (A.S.)

Designed to prepare the student to enter the automotive service profession in a position such as a service manager, service writer or parts manager.

The graduate of the AS program in auto service management will:

- Demonstrate an understanding of the importance of customer satisfaction and the role it plays in the success of a business in the automotive service industry.
- Demonstrate an understanding of the various business models in the automotive service industry.
- Demonstrate the ability to effectively communicate verbally and in writing with customers, co-workers and the employer.
- Demonstrate the ability to diagnose problems with the various systems of the automobile using systematic procedures and logical methods.
- Demonstrate the ability to identify what technical specifications are needed, where to find them and how to use them in the course of performing their duties.
- Demonstrate an understanding of the legal and ethical issues encountered in the automotive repair workplace and make responsible decisions.
- Demonstrate the required mechanical skills and the ability to use the trade tools at a level of proficiency that is expected in the profession.
- Demonstrate the use of the proper procedure for dealing with hazards encountered in the automotive repair work place.
- Demonstrate the ability to perform all of the NATEF tasks in each of the core courses in the option or certificate.

A major of 30 units is required for the associate in science degree.

COURSE NUMBER	TITLE	UNITS
	Required core courses (18 units):	
AT 100	Automotive Fundamentals	4
AT 133	Automotive Engine Rebuilding	5
AT 303	Automotive Electricity	5
AT 314	Suspension and Alignment	4
	Plus a minimum of 12 units from the following	
AT 117	Print Reading and Interpretation	3
AT 300	Shop Math and Measurement	3
AT 306	Auto Air Conditioning Systems	4
AT 313	Automotive Brakes	4
AT 323	Power Trains	5
AT 324	Automatic Transmissions	5
AT 334	Automotive Machining 1	4
AT 341	Fuel Injection/Turbocharging	5
AT 343	Engine Performance Diagnosis	5
AT 344	Emission Control BAR/CAC	4
AT 389	Independent Projects in Automotive Tech	1-3
AT 399	Special Topics in Automotive Technology	0.5-3
BUS 104	Business Organization & Management	3
BUS 107	Human Relations in Business	3

AUTOMOTIVE TECHNOLOGY: AUTO TUNE-UP AND DIAGNOSTIC PROCEDURES (A.S.)

Designed to prepare the student to enter the automotive service profession as a tune-up and diagnostics specialist.

The graduate of the AS program in auto tune-up and diagnostic procedures will:

- Demonstrate an understanding of the evolving technology in the automotive control systems and the impact the automobile has on our environment.
- Demonstrate the ability to quickly master new techniques and skills as required in the automotive tune-up and diagnostic specialty.
- Demonstrate the ability to effectively communicate verbally and in writing with customers, co-workers and the employer.
- Demonstrate the ability to diagnose problems with the various systems of the automobile using systematic procedures and logical methods.
- Demonstrate the ability to identify what technical specifications are needed, where to find them and how to use them in the course of performing their duties.
- Demonstrate an understanding of the legal and ethical issues encountered in the automotive repair workplace and make responsible decisions.
- Demonstrate the required mechanical skills and the ability to use the trade tools at a level of proficiency that is expected in the profession.
- Demonstrate the use of the proper procedure for dealing with hazards encountered in the automotive repair work place.
- Demonstrate the ability to perform all of the NATEF tasks in each of the core courses in the option or certificate.

A major of 30 units is required for the associate in science degree.

COURSE NUMBER	TITLE	UNITS
	Required core courses (19 units):	
AT 100	Automotive Fundamentals	4
AT 303	Automotive Electricity	5
AT 341	Fuel Injection/Turbocharging	5
AT 343	Engine Performance Diagnosis	5
	Plus a minimum of 11 units from the following	
AT 117	Print Reading and Interpretation	3
AT 133	Automotive Engine Rebuilding	5
AT 300	Shop Math and Measurement	3
AT 306	Auto Air Conditioning Systems	4
AT 323	Power Trains	5
AT 324	Automatic Transmissions	5
AT 334	Automotive Machining 1	4

AT 344	Emission Control BAR/CAC	4
AT 389	Independent Projects in Automotive Tech	1-3
AT 399	Special Topics in Automotive Technology	0.5-3

AUTOMOTIVE TECHNOLOGY: AUTO ENGINE REBUILDING (A.S.)

Designed to prepare the student to enter the automotive service profession as a specialist in engine rebuilding and machining.

The graduate of the AS program in auto engine rebuilding will:

- Demonstrate an understanding of the science of the automotive engine.
- Demonstrate the ability to work with a high degree of precision and accuracy using all of the machine tools involved in rebuilding of the automotive engine.
- Demonstrate the ability to effectively communicate verbally and in writing with customers, co-workers and the employer.
- Demonstrate the ability to diagnose problems with the various systems of the automobile using systematic procedures and logical methods.
- Demonstrate the ability to identify what technical specifications are needed, where to find them and how to use them in the course of performing their duties.
- Demonstrate an understanding of the legal and ethical issues encountered in the automotive repair workplace and make responsible decisions.
- Demonstrate the required mechanical skills and the ability to use the trade tools at a level of proficiency that is expected in the profession.
- Demonstrate the use of the proper procedure for dealing with hazards encountered in the automotive repair work place.
- Demonstrate the ability to perform all of the NATEF tasks in each of the core courses in the option or certificate.

A major of 33 units is required for the associate in science degree.

COURSE NUMBER	TITLE	UNITS
	Required core courses (21 units):	
AT 100	Automotive Fundamentals	4
AT 133	Automotive Engine Rebuilding	5
AT 334	Automotive Machining 1	4
AT 336	Automotive Machining 2	4
MT 109	Survey of Machining and Manufacturing	4
	Plus a minimum of 12 units from the following	
AT 117	Print Reading and Interpretation	3
AT 300	Shop Math and Measurement	3
AT 306	Auto Air Conditioning Systems	4
AT 323	Power Trains	5
AT 324	Automatic Transmissions	5
AT 341	Fuel Injection/Turbocharging	5
AT 344	Automotive Emission Control	4
AT 389	Independent Projects in Automotive Tech	1-3
AT 399	Special Topics in Automotive Technology	0.5-3

AUTOMOTIVE TECHNOLOGY: AUTOMOTIVE CHASSIS (A.S.)

Designed to prepare the student to enter the automotive service profession as a specialist in brake and front end work.

The graduate of the AS program in automotive chassis will:

- Demonstrate an understanding of the science of the automotive drive train systems.
- Demonstrate the ability to use the latest techniques and tools used in servicing the automotive drive train.
- Demonstrate the ability to effectively communicate verbally and in writing with customers, co-workers and the employer.
- Demonstrate the ability to diagnose problems with the various systems of the automobile using systematic procedures and logical methods.
- Demonstrate the ability to identify what technical specifications are needed, where to find them and how to use them in the course of performing their duties.
- Demonstrate an understanding of the legal and ethical issues encountered in the automotive repair workplace and make responsible decisions.
- Demonstrate the required mechanical skills and the ability to use the trade tools at a level of proficiency that is expected in the profession.
- Demonstrate the use of the proper procedure for dealing with hazards encountered in the automotive repair work place.
- Demonstrate the ability to perform all of the NATEF tasks in each of the core courses in the option or certificate.

A major of 30 units is required for the associate in science degree.

COURSE NUMBER	TITLE	UNITS
	Required core courses (22 units):	
AT 100	Automotive Fundamentals	4
AT 303	Automotive Electricity	5
AT 313	Automotive Brakes	4
AT 314	Suspension and Alignment	4
AT 323	Power Trains	5
	Plus a minimum of 8 units selected from the following:	
AT 117	Print Reading and Interpretation	3
AT 133	Automotive Engine Rebuilding	5
AT 300	Shop Math and Measurement	3
AT 306	Auto Air Conditioning Systems	4
AT 324	Automatic Transmissions	5
AT 334	Automotive Machining 1	4
AT 341	Fuel Injection/Turbocharging	5
AT 389	Independent Projects in Automotive Tech	1-3
AT 399	Special Topics in Automotive Technology	0.5-3

AUTOMOTIVE TECHNOLOGY: GENERAL TECHNICIAN - TUNE-UP EMISSION CONTROL SPECIALIST (Certificate of Achievement)

Designed to prepare the student to enter the automotive service profession as a general repair technician with an emphasis on tune-up and emissions repair.

The graduate of the certificate program in high-tech general mechanic: tune-up emission control specialist will:

- Demonstrate an understanding of the evolving technology in the automotive control systems.
- Demonstrate the ability to communicate effectively with customers, co-workers and the employer.
- Demonstrate the ability to diagnose problems with the various systems of the automobile using systematic procedures and logical methods.
- Demonstrate the ability to identify what technical specifications are needed, where to find them and how to use them in the course of performing their duties.
- Demonstrate the required mechanical skills and the ability to use the trade tools at a level of proficiency that is expected in the profession.
- Demonstrate the use of the proper procedure for dealing with hazards encountered in the automotive repair work place.
- Demonstrate the ability to perform all of the NATEF tasks in each of the core courses in the option or certificate.

A total of 30 units is required for the certificate.

COURSE NUMBER	TITLE	UNITS
	Required core courses (24 units):	
AT 100	Automotive Fundamentals	4
AT 133	Automotive Engine Rebuilding	5
AT 303	Automotive Electricity	5
AT 341	Fuel Injection/Turbocharging	5
AT 343	Engine Performance Diagnosis	5
	Plus a minimum of 6 units selected from the following:	
AT 117	Print Reading and Interpretation	3
AT 300	Shop Math and Measurement	3
AT 306	Automotive Air Conditioning Systems	4
AT 323	Power Trains	5
AT 324	Automatic Transmissions	5
AT 334	Automotive Machining 1	4

AUTOMOTIVE TECHNOLOGY: GENERAL TECHNICIAN - ENGINE, POWER TRAINS SPECIALIST (Certificate of Achievement)

Designed to prepare the student to enter the automotive service profession as a general repair technician with an emphasis on engine and drive train repair.

The graduate of the certificate program in general technician: engine, power trains specialist will:

- Demonstrate an understanding of the automotive drive train systems.
- Demonstrate the ability to communicate effectively with customers, co-workers and the employer.
- Demonstrate the ability to diagnose problems with the various systems of the automobile using systematic procedures and logical methods.
- Demonstrate the ability to identify what technical specifications are needed, where to find them and how to use them in the course of performing their duties.
- Demonstrate the required mechanical skills and the ability to use the trade tools at a level of proficiency that is expected in the profession.
- Demonstrate the use of the proper procedure for dealing with hazards encountered in the automotive repair work place.
- Demonstrate the ability to perform all of the NATEF tasks in each of the core courses in the option or certificate.

A total of 30 units is required for the certificate.

COURSE NUMBER	TITLE	UNITS
	Required core courses (24 units):	
AT 100	Automotive Fundamentals	4
AT 133	Automotive Engine Rebuilding	5
AT 303	Automotive Electricity	5
AT 323	Power Trains	5
AT 324	Automatic Transmissions	5
	Plus a minimum of 6 units selected from the following:	
AT 117	Print Reading and Interpretation	3
AT 300	Shop Math and Measurement	3
AT 306	Auto Air Conditioning Systems	4
AT 313	Automotive Brakes	4
AT 314	Suspension and Alignment	4
AT 334	Automotive Machining 1	4
AT 341	Fuel Injection/Turbocharging	5
AT 343	Engine Performance Diagnosis	5
AT 344	Automotive Emission Control	4
AT 389	Independent Projects in Automotive Tech	1-3
AT 399	Special Topics in Automotive Technology	0.5-3

BIOLOGY (A.A.)

The associate degree in biology prepares students to move into a curriculum in a four-year institution leading to a baccalaureate degree in such areas as botany, zoology, conservation and teaching. The biologist with a baccalaureate degree is prepared to enter graduate or professional programs of specialized study such as medicine, dentistry, medical technology, osteopathy and veterinary medicine.

The graduate of the AA program in biology will:

- Demonstrate proficient research skills in data gathering and analysis.
- Demonstrate effective communication using the language, concepts and models of biology.
- Demonstrate effective content knowledge of biodiversity.

A major of 23 units is required for the associate in arts degree.

COURSE NUMBER	TITLE	UNITS
	Required core courses (15 units):	
BIOL 150	Cellular Biology	5
BIOL 154	General Botany	5
BIOL 155	General Zoology	5
	Plus a minimum of 8 units selected from the following, all of which are required for the baccalaureate degree:	
CHEM 150	General Chemistry 1	5
CHEM 151	General Chemistry 2	5
PHYS 141	General Physics 1	4
PHYS 142	General Physics 2	4
	Recommended electives:	
BIOL 132	Marine Biology	4
BIOL 145	Desert Ecology	2
BIOL 179	Workshops in Biology	1-3
BIOL 189	Independent Projects in Biology	1-3
BIOL 199	Special Topics in Biology	1-3

BUSINESS ADMINISTRATION (A.A.)

The associate degree program in business administration prepares students to begin upper-division work leading to a baccalaureate degree in business or business administration. Students will recall and apply significant business principles, produce work-based learning projects and demonstrate the ability to follow oral and written instructions.

The graduate of the AA program in business administration will:

- Recall significant business administration issues, theories and applications relevant to subsequent upper-division coursework.
- Apply business administration principles to produce work-based learning projects related to upper-division coursework.
- Demonstrate the ability to follow instructions on assignments and class activities.

A major of 25 units is required for the associate in arts degree.

COURSE NUMBER	TITLE	UNITS
	Required core courses (25 units):	
ACCT 130	Financial Accounting	3
ACCT 140	Managerial Accounting	3
BUS 101	Introduction to Business	3
BUS 110	Business Law	3
CBIS 101	Computer Concepts and Applications	3
ECON 101	Principles of Economics: Macroeconomics	3
ECON 102	Principles of Economics: Microeconomics	3
MATH 123	Elementary Statistics	4