Program Review

Automotive Technology

A combined effort of the Automotive Technology Department faculty members
Industry & Technology Division
El Camino College

Fall, 2013

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1. Overview of the Automotive Technology Program

A. Program/Department Mission Statement

The Automotive Technology (ATEC) program at El Camino College has served the South Bay community since 1947. ATEC has been providing students technical automotive repair and maintenance expertise and experience for almost 70 years. Over the years, the training provided avenues into entry level positions, opportunities for career advancement, adventures in competition and high performance, and forays into new technologies. During the last five years, Long Beach City and Santa Monica colleges have discontinued their automotive technology related programs. Cerritos and Rio Hondo Colleges have guided their programs into alternative fuels and heavy diesel specialties. As a result, our ATEC program is serving a larger community service area and should be set for growth.

The mission of the ATEC program is to provide relevant quality skills, knowledge, diagnostics, and problem solving abilities training to students of diverse ethnic backgrounds and genders to prepare them for entry-level employment and career advancement opportunities in the automotive industry.

ATEC instructors conduct a program review to: assess the effectiveness of the ATEC program, evaluate and improve its performance, and to maximize student success. This program review includes plans addressing local program closings, industry and technological changes, the completion of a new training facility, the retirement of three instructors, and other factors that contribute to program effectiveness; such as, but not limited to, national, state, and local economic trends in the business and automotive environment, and a changing student demographic. Of note, this program review will address three primary areas:

1) A new shop area projected to be operational in spring of 2015.

2) Staffing and faculty development to keep up with faculty turnover and new innovations in the automotive industry such as: alternative fuels, automated computer control and diagnostic systems. And,

3) A consideration of reduced-unit modular courses.

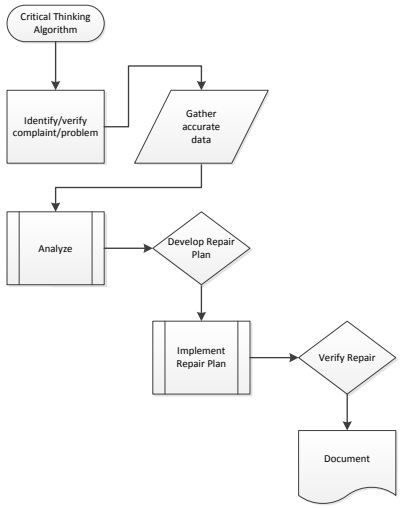
Program Description

ATEC serves the automotive educational needs of the Lomita, Torrance, Inglewood, and South Bay areas. Recently, because nearby colleges have closed or discontinued their ATEC related programs, the ATEC service area has expanded to include areas previously served by Santa Monica College, Long Beach City College, and Harbor College. Capacity issues will need to be considered to meet the larger service area.

ATEC provides both day and night programs to meet the needs of full-time, part-time, and returning students. Many students complete the program successfully and acquire certificates of completion and associate degrees. Success rates are discussed in Section 2.A.4. Many students return to update their skills, knowledge, and training in new automotive and truck repair technologies.

One very strong aspect of this program is that it promotes critical thinking and problem solving. Students are taught systematic approaches to diagnose, trouble shoot, repair, and maintain all manner of automobile and truck components, assemblies, and systems. An abbreviated critical thinking diagnostic algorithm sample follows.

1. Identify and verify the complaint/problem.
2. Gather accurate data.
3. Analyze the data to determine an accurate diagnosis.
4. Develop a repair plan.
5. Implement the repair plan.
6. Verify the success of the repair.



By providing students a critical thinking process, ATEC has produced successful professional technicians. Our graduates work at independent shops, car dealerships and repair facilities. Many have found in city organizations and municipal repair facilities. City fleets that employ our graduates include: Gardena, Hawthorne, Lawndale, Long Beach, Los Angeles, Redondo Beach, Santa Monica; Torrance; municipal employers include: Metropolitan Transit Authority and Los Angeles County. Many of these have further advanced to become experienced team leaders and managers. Others own successful repair shops of their own. A few have returned to pass on their knowledge and experience as automotive instructors.

The Bureau of Labor Statistics summary below demonstrates the median annual wage earned by an automotive technician in May of 2013 was $39,450 per year. The job outlook projects an average growth rate of 17% from 2010 through 2020, which generally is as fast as other occupations. Opportunities for qualified technicians should be very good.

These statistics may vary according to region, individual technician ability, the job market, and other factors.

The Bureau of Labor Statistics has provided the following Occupational Employment and Wage data as of May of 2013 specifically pertaining to Automotive Service Technicians and Mechanics (49-3023) who diagnose, adjust, repair, or overhaul automotive vehicles. This group excludes Automotive Body and Related Repairers (49-3021), Bus and Truck Mechanics and Diesel Engine Specialists (49-3031), and Electronic Equipment Installers and Repairers (49-2096). National employment and mean wage estimates for this occupation from the Bureau of Labor Statistics are listed in the table below.

	Percentile				
Wages	**10%**	**25%**	**(Mean) 50%**	**75%**	**90%**
Hourly	$10.06	$13.10	$17.65	$23.49	$29.43
Annual	$20,920	$27,250	$36,710	$48,860	$61,210

B. ATEC Program Degree and Certificates

An Associate of Science degree requires a minimum of 60 units. The degree allows latitude for students to select courses that satisfy the degree requirements within the college guidelines. ATEC instructors explain degree and certificate requirements to students. To earn an Associate degree in ATEC, students take 35 to 40 units within the ATEC program and the remainder of courses (20 to 25) units from the general educational requirements in accordance with El Camino College guidelines.

Certificate of accomplishment/achievement

Certificates offered and range from 16 to 40 units. The options are listed in the catalog and in the following list. One certificate is pending state approval.

1. Automotive Air Conditioning Technician
2. Automotive Brakes/Suspension Technician
3. Transmission/Drive Train Technician
4. Automotive Engine Rebuilding/Repair Technician
5. Automotive Technician I
6. Automotive Technician II
7. Automotive Tune-Up Technician

The faculty is comprised of three full-time instructors and two part-time instructors. Full-time instructors are very near retirement. Two full-time instructors are planning to retire next year. Previously, there were four full-time instructors; one retired and was not replaced. When combined, the three remaining full-time instructors have 95 years of teaching experience and 140 years of industry experience. All instructors are master mechanics certified by the National Institute of Automotive Service Excellence (ASE),

including one instructor who is also certified in auto body, engine machinist, and trucks. Faculty member educational backgrounds include bachelor and master degrees. Teaching experience includes high school, regional occupational center, community college, and university venues. ATEC faculty tenure of 31 years, have had the benefit of teaching automotive classes under the term of three college presidents, many vice presidents, and deans. Despite campus issues, enrollment and funding fluctuations, and policy changes, the ATEC teachers continue to enjoy instruction and conduct their classes with passion and pride.

C. Alignment with College Mission and Strategic Initiatives

The following table shows how the ATEC program is aligned with the mission statement and fulfills El Camino College Strategic Initiatives.

El Camino College Strategic Initiatives	ATEC Program
SI A: Enhance teaching to support student learning using a variety of instructional methods and services.	The new Shop Complex will be put into service in Spring of 2015. Substantial planning and investment is being made to improve existing classrooms, laboratories, and facilities of the Shop Complex. Three full-time instructors have had an opportunity to design their offices, classrooms, and laboratories of their dreams for the future. The classrooms and laboratories incorporate the latest technologies. Two outstanding part-time instructors have been hired to enhance the program.
SI B: Strengthen quality educational and support services to promote student success.	Manufacturers and dealerships participate in the Industry Advisory Committee meetings. Recommendations are evaluated and deployed to improve student success in terms of program completions and in employment prospects. Tool room staffing and support has been improved to provide students a cost effective laboratory experience. Safety procedures have been enhanced and enforced similarly across all shop laboratories to promote a consistent learning experience.
SI C: Foster a positive learning environment and sense of community and cooperation through an effective process of collaboration and collegial consultation.	Students in ATEC classes work in teams, which teaches them collaboration, team work, and cooperation. ATEC collaborated with the Fire Technology to provide emergency response and rescue training on hybrid vehicles.
SI D: Develop and enhance partnerships with schools, colleges, universities, businesses, and community-based organizations to respond to the workforce training and economic development needs of the community.	ATEC sent one faculty member to West Virginia in May 2013 to train in hybrid vehicles with National Alternative Fuel Training Consortium (NAFTC). Plans include providing future hybrid training for local shops. Proximity to Honda, Toyota, and Tesla, may lead to opportunities to collaborate with them in the near future. A new Shop Complex facility and the opportunity to achieve NATEF certification will make our program more appealing to automotive manufacturers.
SI E: Improve processes, programs, and services through the effective use of assessment, program review, planning, and resource allocation.	Faculty members reviewed and added three SLOs for each course in the program. Assessments were completed on courses scheduled for this year. The assessment, program review, planning, resource allocation, and self-reflection are in a state of continuous improvement. Considerations and dialog are ongoing to improve these processes. ATEC Program review, SLO development, and plan builder continue to evolve.

El Camino College Strategic Initiatives	ATEC Program
SI F: Support facility and technology improvements to meet the needs of students, employees, and the community.	We will be moving into the new Shop Complex in Spring of 2015. This is a momentous occasion; the existing shop is over 50 years old. The new Shop will be a place that reflects to students and the public that we are a top-notch school.
SI G: Promote processes and policies that move the College toward sustainable, environmentally sensitive practices.	We have incorporated safety and cleanliness throughout the shop. There are hazards associated with vehicle maintenance. We make sure that these materials are stored and handled in a responsible manner. We are also widening our program to respond to more ecologically responsible forms of transportation. We promote processes and policies that move the College toward sustainable, environmentally sensitive practices. The new shop has been designed with automatic lighting controls in classrooms, labs, and restrooms. Hand paper towels were to be replaced with electric hot air hand dryers to improve sanitation. Light sensors were to reduce electrical consumption when lighting was not needed.

D. Status of Previous Program Review Recommendations

Shop Lights

In 1947, when the existing shop was built, natural abundant lighting was not a requirement to work in roomy uncluttered automobile engine compartments. Shop lighting by today's standards is inadequate. Effective this spring, this recommendation is no longer applicable. After 68 years, we will move into our new Shop equipped with abundant natural lighting.

Three cancelled classes need to be reinstated (ATEC 1, ATEC 21, and ATEC 80).

This recommendation has been addressed with the opening of the new building. During the previous four years, California had experienced reduced education funding. Course cancelations were not specific to automotive technology; they reflected statewide difficult economic times. Courses were closed in ATEC as well as other divisions similarly situated. Courses have been restored and growth is on the horizon. An introductory ATEC 1 class was added in fall 2013. Another ATEC 1 class was added during summer 2013. Another ATEC 1 and an ATEC 81 course are added in summer of 2014.

ATEC acknowledges the effects of variable state funding, anticipates timely improvements from Proposition 30, and remains hopeful for more stable funding.

Retired faculty

A new full-time instructor was just hired, but, as if it were planned, another full-time faculty member just retired. We anticipate more retirements during 2014-15. We have

been unable to hire new instructors so they can work concurrently with instructors before they retire to support continuity of best practices. We are behind the curve with staffing replacements, but we anticipate our retiring faculty members will be replaced.

2. Analysis of Institutional Research and Planning Data

A. Provide and analyze the following statistics/data

1. Head Count

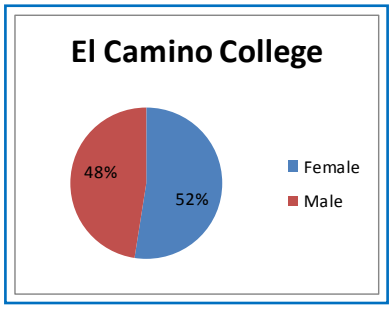
The Headcount table below demonstrates the number of students who were taking at least one course in ATEC during the fall and spring semesters of each year between 2009 and 2012. Headcount varies from a high of 220 in the spring of 2010 to a low of 136 in fall 2012. Higher enrollments in the fall of 2009 result in higher enrollment numbers in the following spring reflecting cohorts progressing through the program. An average 34 percent drop in ATEC headcount is noted between 2009 and 2012. That drop is attributed to closing classes, students having difficulty getting classes, and reduced enrollment due to State funding constraints.

Headcount	2009	2010	2011	2012	ECC Student Population	District Boundary Population @ 2010 Census
Fall	219	212	214	136	*23,409*	*556,400*
Spring	209	220	157	147	*22,660*	*556,400*

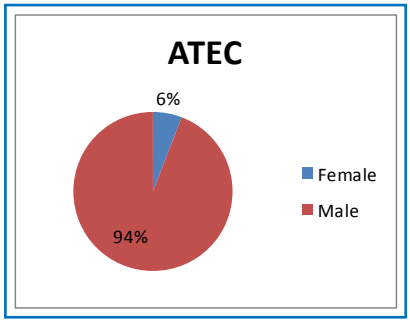
Headcount and enrollments per student on an academic year are shown in the following table. The analysis is provided in the previous paragraph.

Participation	2009-10	2010-11	2011-12	2012-13
Headcount	377	377	325	227
Enrollments/Student	1.56	1.50	1.45	1.59

2. Demographics



About 1,163 more females attend then males. Otherwise, the 23,409 students that attend El Camino College are balanced. Not so in ATEC. Male students outnumber female students 128 to 8. ATEC students account for only 1 percent of college attendance.



With regard to ethnicity, ATEC almost mirrors the boundary census population. 58 percent categorize themselves as Latino, 13 percent White, 13 percent African-American, and 12 percent Asian. Whereas, the campus ethnicity is 45 percent Latino, 17 percent African-American, 16 percent White, and 16 percent Asian.

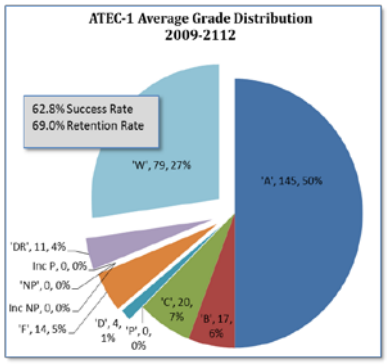
With regard to age distribution, from 2009 through 2012, 12 percent were age 18. 18 percent of students were 19 years of age. And, 13 percent were age 20. 21 percent of students are in a second prominent 25 through 35 year age group. This older group is predicted by Institutional Research to be gaining in size. Generally, from these two age groups, we can surmise two main cohorts, one entering the field, and the second advancing in their careers or preparing for a career change.

3. Course grade distribution

Grade distributions for all ATEC courses are located in Appendix C. Of interest are average grade distributions sampled from 2009 through 2012. From these averages, the following trends and conclusions can be drawn.

ATEC 1 is an introductory course to automotive servicing which provides general knowledge of the theory, construction, maintenance, and operation of the four-stroke-cycle internal combustion engine, ignition, timing, fuel, cooling, electrical charging systems, steering, driveline, brakes, and suspension. It is a two-unit course, which meets once a week for sixteen weeks. Each week, the class meets for two hours and fifteen minutes of lecture and two hours and fifteen minutes of lab. All laboratory activities are hands on and demonstrate shop safety, proper use of tools, and maintenance procedures.

Sixty nine percent of the ATEC 1 students that attended at census date completed the course. Fifty percent of the students completed the course with a grade of "A." Six percent received a "B," and seven percent received a grade of "C." Only one percent received a grade of "D" and five percent received a grade of "F." Twenty-seven percent withdrew or were dropped after the census date.



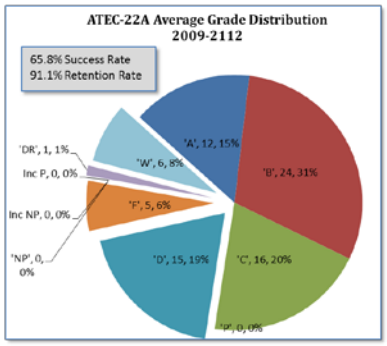
These statistics are reasonable for an introductory course. The material taught is relatively straight forward in nomenclature and general automotive and industry concepts. Reasons for the high rate of withdrawal include personal issues, difficulty managing the requirements of college and work, and some learned that auto mechanics is not something that interests them.

Some students who take ATEC 1 have no intention of becoming auto mechanics, but just want to gain familiarity with the vehicle (the icon of our culture) that they drive. The students that remain in ATEC 1, do exceptionally well in this introductory course. Four (4) years of data show that fifty (50) percent of the students performed outstandingly well. The grade distributions for ATEC 1 are shown in the pie chart to the right.

Grade distributions for ATEC 22A tell a different story. ATEC 22A is an 8-unit course introducing students to tune-up, electrical and fuel systems. Students who take this

course are presumed to have completed the prerequisite course ATEC 1 or have acquired the equivalent. ATEC 22A meets for a duration of 5 hours and 38 minutes of lecture and 11 hours and 15 minutes of lab each week for 16 weeks. This particular class, because of the long hours, is only offered during the day. ATEC 23 and 24 are shorter courses that are offered for night students. ATEC 23 and 24 taken consecutively are equivalent to 22A. ATEC 22A, and 23 and 24 cover construction, operation, and maintenance of the following systems: electrical charging, cooling, emission controls, fuel, and ignition. Laboratory activities stress the proper use of test equipment and repair techniques and procedures used in the industry.

Although, ATEC 22A is considered an introductory course, the grade distribution for this course is much different from ATEC 1. The grade distribution for ATEC 22A over the 2009–2012 period reflects a standard grade distribution curve: 15 percent received an "A," 31 percent received a "B," 20 percent received a "C," 19 percent received a "D," and 6 percent received an "F." The average withdrawal rate for ATEC 22A after census is 8 percent.



Three full-time instructors have been teaching these courses for nearly thirty years. Their grade distributions have been fairly consistent and predictable. Examining specific courses from 2009 – 2013 show expected grades variations which reflect normal variances. The full-time instructors rotate assignments every two years. Recently, two part-time instructors have been added, which may influence the distribution of grades.

4. Success and retention rates

ATEC 1, a two unit introductory course, show success and retention rates of 62.8 and 69.0 percent, respectively. These rates are much lower than the average for the Industry and Technology division and the El Camino Campus as a whole. Success and retention for the Industry and Technology Division are 75.7 and 87.8 percent, respectively[1]. College success and retention rates are 69.8 and 84.3 percent, respectively. Almost in contradiction with ATEC1 success rates, the success rate for ATEC 22A, a more advanced courses, is 65.8 percent — 10 percent lower than the division's 75.7 percent. The retention rate of ATEC 22A is 91.1 percent. Student success and retention rates for Industry and Technology Division are 75.7 and 87.8 percent, respectively. El Camino College (campus wide) success and retention rates are 69.8 and 84.3 percent, respectively. In general, the Industry and Technology Division demonstrates higher success and retention rates than the campus at large.

[1] Institutional Research Academic Performance

When analyzing success and retention rates, one should take into account employment effects, which attain student, department, and community goals, but contradict and complicate the understanding of success and retention metrics. With regard to attaining student, department, and community goals, students who take two courses in Automotive Technology, say a general automotive repair and a brake or engine repair course, can (and often do) get a job. The problem with that kind of employment success is that the employed student may leave college or take a hiatus and not complete the program resulting lower department degree and certificate completion rates. Further complicating matters, there is no feasible way for the college, or the college system for that matter, to track and demonstrate these employment successes. As a result this data is attributed incorrectly to "non-completers," which is interpreted negatively, undermining overall program success and retention performance.

Yearly total success rates indicate a trend of 5% improvement 2009 – 2013. The lowest success rate was 65.4 % in fall 2009 and the highest was 70.2% in fall 2011. Preliminary success standard 2009 – 2013 was 64.9%. 5 year success average was 69.3%. 5 year success minimum was 60.6%.

Yearly total retention rates indicate a low of 73.4% in spring 2012 and a high 82.7% in fall 2012. The low in spring 2012 is influenced by 3 red highlighted lows.

A factor not revealed by data is the influence on grades, success rates and retention rates by teachers who drop students who are not meeting class requirements. Dropping prevents students from being placed on academic probation. Some students do not realize the impact of poor grades on their GPA and the difficulty to raise substandard GPAs.

At this time, the Automotive Technology program has established a success and retention floor of 60 percent and 70 percent, respectively. If success and retention numbers drop below this floor, faculty should reconvene, assess the situation, determine causes, and develop an appropriate action plan.

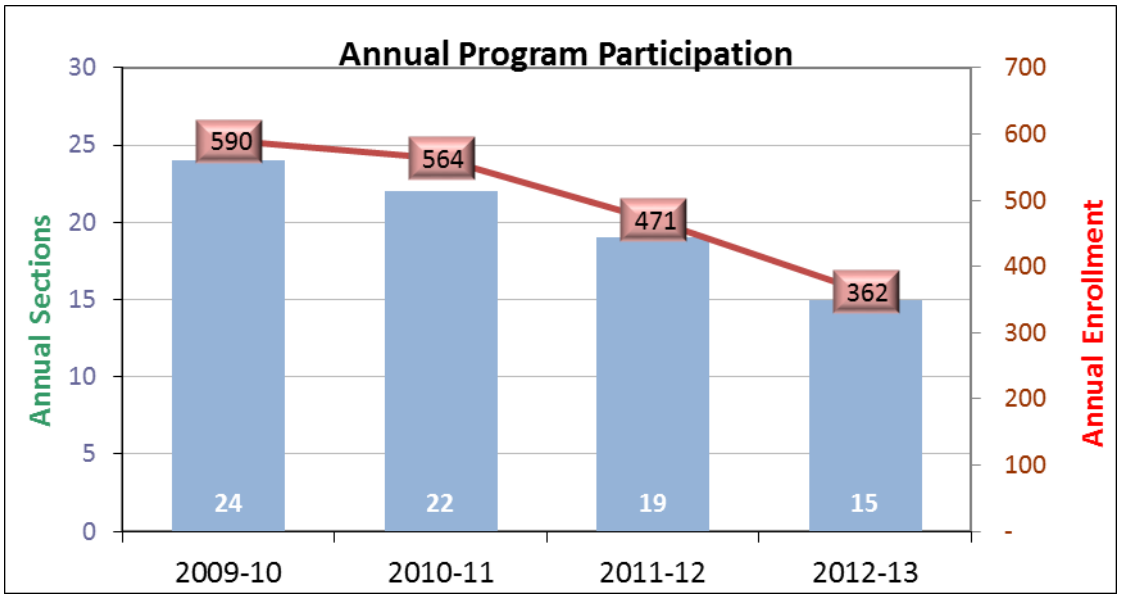
5. Comparison of success and retention rates with regard to face-to-face classes and distance education classes

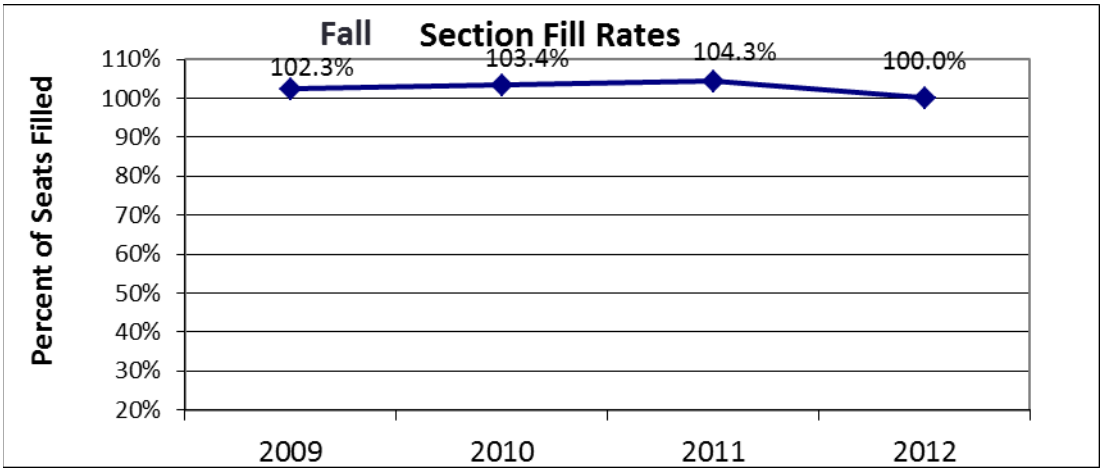
It is difficult to conduct a comparison between face-to-face ATEC courses and distance education courses. Currently there are no distance education courses being offered in ATEC. Initially, distance education may be considered a viable alternative but in application, distance education quickly becomes problematic for hands-on laboratory courses. Imagine the difficulty in employing one's senses to trouble shoot, setup and adjust diagnostic equipment, and clean up the shop, much less practicing safety, handling hazardous materials, and team-building exercises, peering at a monitor and interacting with the virtual environment.

6. Enrollment statistics with section, seat counts, and fill rates

The tables and charts below indicate there are less sections being offered, less students in the program, and the fill rates are increasing from 94.2% in 2009 – 2010 to 110.6 % in 2012 – 2013. This fill rate has continued to rise during fall 2013. A combined lab class during fall 2013 has an over-enrollment of 40%.

	2009-10	2010-11	2011-12	2012-13	4 Year Average
Annual Enrollment	590	564	471	362	497





Although there have been numerous section cuts, ATEC has enjoyed high fill rates over the last four years. High fill rates are a good indicator of student demand and that we should consider expanding existing courses and possibly broadening the ATEC program.

7. Scheduling of courses

The ATEC program includes four major areas of study and one course in Automotive Air Conditioning. The four major areas follow and the one course is Automotive Air Conditioning (AT81).

1. Engine repair (AT41, 42, 43 45),
2. Engine performance (AT 21, 22A, 22B, 23, 24, 25),
3. Brakes/suspension/steering (AT 11, 13, 14), and
4. Driveline and drive axles (AT 33, 34, 35).

Together these four major areas and one course meet the eight national certification disciplines required by Automotive Service Excellence (ASE). Some of our courses, such as ATEC 22A, ATEC 22B and 23, 24, 25, 26, meet aspects of the advanced ASE certification which prepares students to meet some of the requirements for the Smog Check Technician license. The Smog Check technician requirements are governed by the Bureau of Automotive Repair.

There are essentially two ATEC programs, one for day students and one for night students. The day program offers four 8-unit courses and one 2-unit course. There are two 8-unit courses with combined labs (AT 22A & B) offered in the morning and two separate 8-unit courses scheduled during the afternoons. This arrangement was made in the 1990s when enrollment dropped and all divisions were competing for students. ATEC decided at that time not compete for morning students.

The evening program offers eleven 4-unit courses; a couple of courses are less than 4 units. These evening classes are offered on a rotational basis to address night student needs.

Although day and night schedules are not believed to be as cost effective as program changes and recommendations proposed later in this review, they were justified based upon a need to:

1. Reduce sections during decreased funding,
2. Maintain the program integrity, and
3. Provide an opportunity for the students who have full time day jobs, allow the students to earn certificates of completion and/or an associate degree at night in the ATEC program.

Two morning eight unit classes with combined labs are scheduled from 7:30 a.m.–12:50 p.m. Monday through Thursday. Two 8-unit afternoon classes are scheduled from 2 p.m.–5:50 p.m. Monday through Thursday. One 2-unit day class is scheduled from 12:30 p.m.–4:50 p.m., on Tuesday. One 2-unit evening class is scheduled from 6 p.m. – 10:20 p.m.

One 4-unit evening class is scheduled from 7 p.m. – 10 p.m., M & W. One 4-unit evening class is scheduled from 7 p.m. – 10 p.m., T & Th.

4-unit evening classes are offered on a rotational basis, thus preserving program integrity and an alternative to eliminating the course. Evening students are reminded that if they miss a semester, the skipped class will not return for at least 2 years. This situation is caused by budget cuts.

Day and evening classes are scheduled in a logical sequence allowing students to complete the program in a timely manner. However, as mentioned above, the evening student wishing to complete training cannot afford to skip a semester of school for 4-5 years.

Enrollment by Time of Day

Fall Term	2009	2010	2011	2012
Day	55.3%	57.9%	46.1%	69.2%
Night	44.7%	42.1%	41.2%	30.8%
Weekend/Unknown	0.0%	0.0%	12.7%	0.0%

8. Improvement rates

	Fall 2009		Fall 2010		Fall 2011		Fall 2012	
Ethnicity	Success	N	Success	N	Success	N	Success	N
African-American	54.2%	24	29.0%	31	65.5%	29	68.4%	19
Amer. Ind. or Alaska. Native	100.0%	2	100.0%	2	50.0%	2	0.0%	
Asian	87.1%	31	79.5%	39	83.3%	36	77.8%	18
Latino	73.7%	118	68.7%	99	75.4%	122	64.1%	92
Pacific Islander	100.0%	2	100.0%	2	0.0%		0.0%	
Two or More	60.0%	5	71.4%	7	55.6%	9	100.0%	3
Unknown or Decline	66.7%	24	60.0%	15	83.3%	6	66.7%	3
White	53.3%	45	75.6%	41	82.1%	28	81.0%	21
Gender								
M	69.7%	228	65.5%	223	75.0%	216	68.7%	147
F	65.2%	23	84.6%	13	81.3%	16	77.8%	9
X	0.0%		0.0%		0.0%		0.0%	
Age Groups								
19 or less	70.6%	85	60.5%	81	72.1%	68	50.0%	40
20 to 24	63.5%	96	67.7%	93	78.1%	96	82.3%	62
25 to 49	72.4%	58	70.7%	58	71.2%	59	61.9%	42
Over 49	91.7%	12	100.0%	4	100.0%	9	91.7%	12

X: Counts are suppressed for groups with less than 10 students.
Shaded regions indicate groups achieving at a rate less than 80% of the reference group, respectively. Reference groups are White, male, and 20 to 24 years old.

9. Additional data compiled by faculty

The Latino/Latina population is increasing but there are fluctuations in their success and retention rates as well as their grades. These occurrences should begin to stabilize and improve as the younger population go through the K-12 school system. Academic skills should be improved in the future.

Student success and retention is affected by many external factors not identified by data. These significant factors are more about the student include but are not limited to births, deaths, sickness, disintegrating family structure, broken relationships, substandard college preparation, and financial hardships. Some students cannot successfully enroll in classes because they lack tuition funds and are not aware of financial aid or financial aid is difficult to receive.

B. LIST ANY RECOMMENDATIONS

1. Develop a survey to track our graduates within the first year of leaving ECC, whether or not they achieved their educational goal. Survey Monkey provides an easy, technologically-timely, survey medium. Self-addressed post cards with paid postage will encourage survey returns within the first year. Many students change their address and phone number after completing school. El Camino student email addresses are not maintained after graduation. Students do not usually notify the campus of their new contact information.

2. Inform the students about financial aid opportunities and requirements. The textbooks are expensive. Many students cannot afford books. Consideration of rental textbooks at the Bookstore or textbook grants might be in order. Other programs with high fill rates have rented relatively expensive textbooks for about $20 per semester—a viable option for students.

3. CURRICULUM

(Review and discuss the curriculum work done in the program during the past four years, including the following :)

A. PROVIDE THE CURRICULUM COURSE REVIEW TIMELINE TO ENSURE ALL COURSES ARE REVIEWED AT LEAST ONCE EVERY 6 YEARS.

The Industry and Technology Division and the College Curriculum Committees keep the ATEC Department's course reviews current and on track. The current 6-year course review timeline is located in Appendix D.

B. EXPLAIN ANY COURSE ADDITIONS TO CURRENT COURSE OFFERINGS

As of this printing, no new courses have been developed or added to current course offerings. That is not to say, however, that the ATEC group has been remiss in considering the addition of new courses covering new technologies such as: hybrids, alternative fuels, and electric vehicles. These courses are being contemplated. One faculty member attended a forty hour 16 module training session with the intention of expanding the program, but then later concluded that covering new technologies in existing classes would dilute time spent on existing core subject matter. In hindsight, more emphasis was placed on poor shop lighting, inability to achieve ASE National Automotive Technicians Education Foundation (NATEF) certification, the eminence of retirements, the urgent need for instructor replacements, and requesting additional space in a new smaller shop facility scheduled to come on line in spring of 2015. As a result, new courses were not developed.

C. EXPLAIN ANY COURSE DELETIONS AND INACTIVATIONS FROM CURRENT COURSE OFFERINGS.

ATEC 80 Clean Air ("Smog") course was deleted because repeated cancellation due to low enrollment. Although the State sponsored smog program did generate some money for the College and ATEC program, there were a number of complicating factors: The smog diagnostic equipment had some performance issues that could not be rectified. There were changing State mandates and management issues which did not bode well with the program. And, the reduced new shop size resulted in the smog certification program being left out of the mix.

D. Describe the courses and number of sections offered in distance education. (Distance education includes hybrid courses.)

There may be a time in the future when Distance Education courses are offered but at the present time no ATEC courses are being offered in the Distance Education format at this time.

E. Discuss how well the courses, degrees, or certificates are meeting students' transfer or career training needs:

Although students in the ATEC program do pursue transfer opportunities to four-year institutions, the majority seek careers in the automotive industry directly upon program completion. Some seek and find employment as soon as they complete a few brake or alignment courses. As a result of our student career emphasis, we find learning automotive technology requires more hands-on training and laboratory experience for job preparation, job security, and longer term for students who return to complete their degrees for advancement. In this regard, the existing ATEC courses, certifications, and degrees have been meeting students' transfer and career training needs.

New course expansion into fields and certificate-generating alternative fuels, electric vehicles, and automobile electronic and computer-controlled systems specialties in the very near term is inevitable.

1. Have all courses that are required for your program's degrees and certificates been offered during the last two years? If not, has the program established a course offering cycle?

Not all courses have been offered during the last 2 years, but courses are placed in a semester rotating cycle in alternating day and evening sessions, thus ensuring course availability and access. Part-time and evening students may take as long as 5 or more years to complete their degree.

2. Are there any concerns regarding program courses and their articulation?

Course articulation was in place with Southern California Regional Occupational Center (SCROC).

Faculty should pursue articulation with CSULA and CSULB. Articulation may prove mutually beneficial to improve enrollment here and at the CSU schools. ATEC faculty should seek articulation agreements to help our students further their educations, allow students to transfer more units, and improve the program that ATEC offers.

3. How many students earn degrees and/or certificates in your program? Do students take licensure exams? If so, what is the pass rate? If few students receive degrees or certificates or if few students pass the licensure exam, should the program's criteria or courses be re-examined? Set an attainable, measurable goal for future degrees, certificates, and/or licensure pass rates.

There are barriers to gathering pertinent meaningful data. Unless a student personally informs the school, we do not know exactly why the student left our program. Many students have taken just one course and are hired for a specific job and many do not return to continue their training. For example, a student can complete an 8 unit brakes/suspension/steering course, and find employment as an alignment technician and earn a respectable wage. There are only three areas of the curriculum for which the State of California requires a license: A smog technician's license, which currently is not offered at ECC; a lamp adjuster/inspector license, and brake adjuster/inspector license, both of which do not require any formal training. However we do recommend that students apply for and take Automotive Service Excellence (ASE) examinations, which are provided through the National Institute of Automobile Service Excellence (NIASE) directly.

Some students return after several years in the career for additional training or complete a certificate or their degree. The problem in this common scenario is that employment success, industry advancement, and student and community benefits are not tracked properly. They should be considered successes in and of themselves.

These students are recorded as non-completers, and our program has served them well. The records do not reflect that these students have completed a training course in which they have acquired employment in the ATEC field.

ATEC faculty continues to encourage students to focus on their goals and achieve their dreams. Teachers take time during lectures and labs to give anecdotes of our successful students by stressing how success required commitment, dedication, sacrifice, and planning. These efforts contribute to the number of Associate degrees and certificates earned. The number of degrees remains fairly constant. As shown below the number of certificates declined during recessionary years but still has shown steady increase.

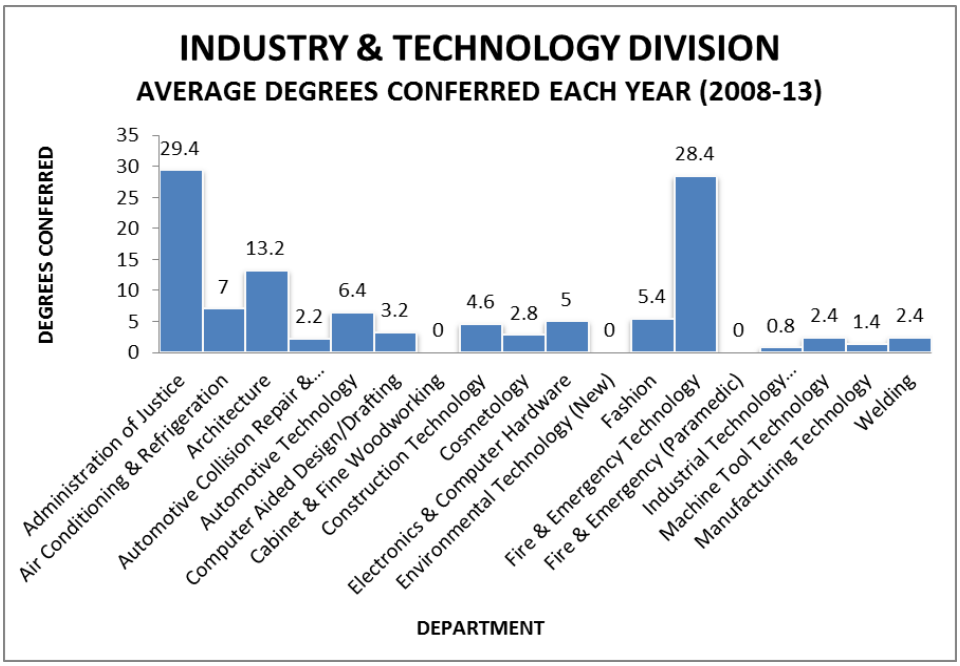
Completions for 2012-2013:	
Associate Degrees	6
Certificates	58

Completions for 2010-2011:	
Associate Degrees	8
Certificates	14

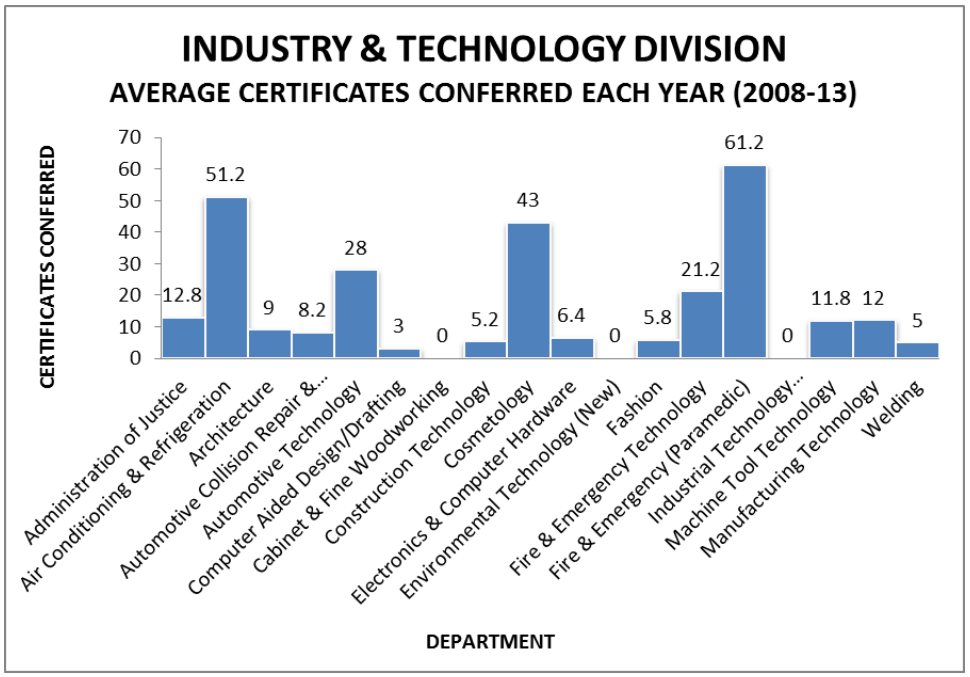
Completions for 2008-2009:	
Associate Degrees	4
Certificates	26

Completions for 2011-2012:	
Associate Degrees	6
Certificates	27

Completions for 2009-2010:	
Associate Degrees	8
Certificates	15



The chart above includes the numbers of degrees generated by each department. Within the Industry & Technology Division, ATEC ranked fourth in the number of degrees conferred averaging 6.4 degrees annually over the period 2008 through 2013[2]. In the following chart, ATEC ranked fourth in the number of certificates conferred averaging 28 certificates annually over the period.



[2] El Camino College Institutional Research

Industry licenses and employment metrics are difficult to obtain. Unless a student personally informs the school, outside of Industry Advisory comments, we really do not know how well we are doing in this area. Therefore, ECC should explore strategies to gather this important data perhaps requesting Institutional Research to collect the data using technology. Setting attainable, measurable goal for future degrees, certificates, and/or ASE pass rates can be implemented when this data mechanism is developed.

Graduates begin their career at a lower skilled/trainee level, then progress up to journeyman and attaining master distinction in 5-7 years.

Auto students are advised to take their Automotive Service Excellence (ASE) national certification test upon completing a specific course instead of waiting for graduation when their memory diminishes of learned skills and knowledge. The ASE certification requires passing the test and 2 years of work experience. ASE awards 1 year of experience for 2 years of attending school.

F. List any related recommendations.

1. Achieve NATEF Certification.
2. Review possibility of adding alternative fuels and electric to automotive program curriculum and develop implementation plan.
3. Investigate articulation agreement possibilities with CSULA and CSULB.
4. Ask Institutional Research to investigate and provide student employment statistics.

4. Assessment and Student and Program Learning Outcomes

A. Provide a copy of your alignment grid, which shows how course, program, and institutional learning outcomes are aligned.

Industry and Technology Institutional (ILO), Program (PLO), and Course (SLO) Alignment			
Program: ATEC	Number of Courses: 17	Date Updated: Fall 2013	Submitted by: Bob Beaudoin

ILO Rating Rubric:

- **4**: A major focus of the course. Direct instruction is provided. Students are evaluated multiple times (and possibly in various ways) throughout the course.
- **3**: An important part of the course. Some direct instruction is provided and students are evaluated on the concepts once or twice within the course.
- **2**: Only a minor focus of the course. Some instruction is given in the area but students are not formally evaluated on the concepts.
- **1**: May be tangentially part of the class, but is not directly taught or evaluated or is not part of the course at all.

Institutional Learning Outcomes (ILOs)	I. Content Knowledge	II. Critical, Creative, and Analytical Thinking	III. Communication and Comprehension	IV. Professional and Personal Growth	V. Community and Collaboration	VI. Information and Technology Literacy
Overall Rating	4	3	2	2	2	1

Program Level SLOs	**ILOs to PLO Alignment** (Rate each 1-4)					
	I	II	III	IV	V	VI
PLO1: ASE Certification Test Exam Given an in class exam, based on readings, classroom discussions, and demonstrations, the student will be able to take a Pass/No Pass practice exam, or an official ASE Certification Test exam with a grade equivalent of "pass."	4	2	1	1	1	1
PLO2: Skills for Entry Level Positions Upon completion of a course of study in ATEC, the student will develop knowledge and skills for job entry positions in the automotive field.	3	2	1	1	1	1
PLO3: Updated Knowledge and Skills Upon completion of a course of study in ATEC, the student working in the field will develop updated knowledge and skills in the automotive field.	4	2	1	1	1	1

B. PROVIDE A TIMELINE FOR COURSE AND PROGRAM LEVEL SLO ASSESSMENTS.

The following timeline has been in place for ATEC course and program level SLO assessments. However, recognizing the time that has been invested this schedule will be changed in the near future to level out the workload from semester to semester.

SLO Timeline *Worksheet*

Division: Industry & Technology Program: Automotive Repair Program Review Date: Fall 2013

Directions: Use this worksheet to schedule assessments for each SLO Statement over the four-year timeline. When complete, return to your facilitator by January 31 for input into TracDat.

Course and SLO	Note if offered only in FA/SU/SP	SP2014	SU2014	FA2014	SP2015	SU2015	FA2015	SP2016	SU2016	FA2016	SP2017	SU2018	FA2018
ATEC Prog1										X			
ATEC Prog2													X
ATEC Prog3				X									
ATEC 1 SLO1											X		
ATEC 1 SLO2											X		
ATEC 1 SLO3											X		
ATEC 11 SLO1											X		
ATEC 11 SLO2											X		
ATEC 11 SLO3											X		
ATEC 14 SLO1											X		
ATEC 14 SLO2											X		
ATEC 14 SLO3											X		
ATEC 16 SLO1											X		
ATEC 16 SLO2											X		
ATEC 16 SLO3											X		
ATEC 21 SLO1				X									
ATEC 21 SLO2				X									
ATEC 21 SLO3				X									
ATEC 22A SLO1					X								
ATEC 22A SLO2					X								
ATEC 22A SLO3					X								
ATEC 22B SLO1							X						
ATEC 22B SLO2							X						
ATEC 22B SLO3							X						
ATEC 23 SLO1					X								
ATEC 23 SLO2					X								
ATEC 23 SLO3					X								
ATEC 24 SLO1					X								
ATEC 24 SLO2					X								
ATEC 24 SLO3					X								
ATEC 25 SLO1							X						
ATEC 25 SLO2							X						
ATEC 25 SLO3							X						
ATEC 26 SLO1							X						
ATEC 26 SLO2							X						
ATEC 26 SLO3							X						
ATEC 33 SLO1										X			

SLO Timeline *Worksheet*													
Division: Industry & Technology		Program: Automotive Repair								Program Review Date: Fall 2013			
Directions: Use this worksheet to schedule assessments for each SLO Statement over the four-year timeline. When complete, return to your facilitator by January 31 for input into TracDat.													
Course and SLO	Note if offered only in FA/SU/SP	SP2014	SU2014	FA2014	SP2015	SU2015	FA2015	SP2016	SU2016	FA2016	SP2017	SU2018	FA2018
ATEC 33 SLO2										X			
ATEC 33 SLO3										X			
ATEC 34 SLO1										X			
ATEC 34 SLO2										X			
ATEC 34 SLO3										X			
ATEC 35 SLO1										X			
ATEC 35 SLO2										X			
ATEC 35 SLO3										X			
ATEC 41 SLO1										X			
ATEC 41 SLO2										X			
ATEC 41 SLO3										X			
ATEC 42 SLO1								X					
ATEC 42 SLO2								X					
ATEC 42 SLO3								X					
ATEC 43 SLO1								X					
ATEC 43 SLO2								X					
ATEC 43 SLO3								X					
ATEC 45 SLO1										X			
ATEC 45 SLO2										X			
ATEC 45 SLO3										X			
ATEC 80 SLO1										X			
ATEC 80 SLO2										X			
ATEC 80 SLO3										X			
ATEC 81 SLO1	SU								X				
ATEC 81 SLO2	SU								X				
ATEC 81 SLO3	SU								X				

C. State the percent of course and program SLO statements that have been assessed.

Currently all ATEC courses have three SLO statements. All of the ATEC courses (100%) have had at least one SLO assessed.

D. Summarize the SLO and PLO assessment results over the past four years and describe how those results led to improved student learning. Analyze and describe those changes. Provide specific examples.

One SLO statement requires the use of safety equipment, specifically safety glasses. The students are made aware of the safety information and are required to follow these safety procedures. One major safety requirement is the wearing of safety glasses at all

times while in the shop area. Currently, the automotive instructors require all of the students who are in class to wear safety glasses while in the shop area. The students are also required to follow all other safety rules and procedures as determined by the instructor, established class requirements, and conditions of tool use. At first, it was difficult to create a culture of safety. Over the last four years of training and enforcement, students wear their safety glasses and discuss safety issues as a result of a now established and accepted safety culture. Student learning has improved in the area of safety awareness.

The Program Student Learning Outcome assessment report completed in spring of 2012 used either preparatory or official pass/fail type ASE exam to verify that students developed knowledge and skills to prepare them for entry level skills in the automotive field. 72 percent of the students who participated in this exam passed. Students reported after taking the exam that they could have done better had they paid more attention to class lectures and lab procedures. Findings implied additional instructor emphasis should be placed on automotive shop safety procedures.

E. Determine and discuss the level your program has attained in the SLO rubric in Appendix C. (Awareness, Developmental, Proficiency, or Sustainable Continuous Quality Improvement)

We are at a level of sustainable continuous quality improvement. The student learning outcomes and assessments are ongoing, systematic, and used for continuous quality improvement. We have increased the number and quality of our student learning outcomes. SLO are a part of our culture. We discuss them at division and department meetings and amongst the faculty members. SLOs provide a basis for performance, provide justification for improvements, and result in program financial support. Recently, the college invested in TracDat, which demonstrates that we as an institution recognize their importance and have changed and improved college-wide structures to support these processes.

F. Describe how you have improved your SLO process and engaged in dialogue about assessment results.

SLO statements have been included in every course syllabus. The students have been made aware of these SLOs. SLOs have been established as basis criteria for student performance and instructor success. SLOs assessments allow instructors to critically evaluate their courses and to improve performance over the long term. Assessment metrics provide a basis to consider and discuss future course changes to improve the program. SLOs have provided a mechanism to evaluate, discuss, and involve all parties in improving our programs. The SLO assessment process is discussed with our industry

partners and at our advisory meetings. In order to stay current with automotive repair industry needs, new equipment is required to provide up to date training in ATEC. We are constantly requesting new up-to-date equipment.

G. LIST ANY RELATED RECOMMENDATIONS.

1. We are applying SLO assessments to recommendations, budget decisions, and program evaluations. We recommend periodic SLO assessment training updates to include these new applications and to maintain uniformity.

5. Facilities and Equipment

A. Describe and assess the existing program facilities and equipment

The existing building was one of the first constructed after WWII and remodeled in 1980. It has served students fairly well for over 33 years since being remodeled. The program has increased in size and we recognized and welcome a new shop facility that is due to come on line in spring of 2015. As our existing facility and equipment will soon be replaced, a discussion of our new facility may be a better use of our efforts. Faculty spent many hours developing a positive learning environment for students. We used past experience and lessons learned from the present shop included it in the new shop design ideas. Our concerns regarding the new facility include space requirements, changing technology, equipment needs.

With regard to space requirements, the space allotted for ATEC is 4,000 square feet smaller than the existing shop area. We foresee a need for increased classrooms, office space, and instructors required in ATEC. As a result significant downsizing will be taking place in the very near future. We used innovative ideas to increase useable work areas, such as triple purpose work benches to serve as decks, work, and storage benches. There is one very serious concern about the limited number of classrooms in the new building. In the existing shop which includes air conditioning, auto collision, and welding, as well as, ATEC there are six classrooms. In the new shop there are only two classrooms that will be shared by all departments. As a result the instructors set aside areas in their labs that can serve as lecture/labs areas in the new design. Still, there is a concern that the facility may not be adequate for program growth.

With regard to changing technology, none of us are sure what the future may bring, but as far as we are able to see new technologies will include alternative fuels, electric and hybrid vehicles. Further into the future, cars may support computer and guidance systems and not need drivers. These advanced systems may require changes in the curriculum to support technicians of the future.

With regard to equipment needs, we currently need new 4-wheel alignment machines, road force variation wheel balancers, tire mounting machines which all meet new vehicle manufacturer's requirements. The ATEC department also needs new machining equipment for automotive machining and engine rebuild/repair. A power hone for cylinder refinishing, align hone for cylinder block finishing, connecting rod hone, valve seat surfacing equipment and valve resurfacing equipment to meet manufacturers

requirements. The ATEC department needs new training aids available through outside vendors. The Automotive department also needs new torque wrenches and equipment to calibrate the torque wrenches.

An 18" over hang will allow placing stools underneath during lab. In addition, these benches must be custom built to accommodate assembled and disassembled engines, transmissions, etc. for storage. At the end of each class everything will be placed in these desk/work/storage triple usage benches for component security. Additional storage space for student projects will be non-existent.

Present architectural sketches reveal an open desk with an 8-inch overhang. Standard stool diameters are 16" minimum. Our standard students' derrieres must fit standard stools, which must slide under a 16" overhang.

Meeting requests to address building concerns have been completed and the issues have been addressed. Meetings with Lend Lease, an oversight company hired by ECC to work with contractors and architects continue with periodic meetings scheduled into March 2014 to clear any equipment, construction and ADA concerns.

B. EXPLAIN THE IMMEDIATE (1-2 YEARS) NEEDS RELATED TO FACILITIES AND EQUIPMENT. PROVIDE A COST ESTIMATE FOR EACH NEED AND EXPLAIN HOW IT WILL HELP THE PROGRAM BETTER MEET ITS GOALS.

Major items were addressed in the new shop planning schedules.

To provide up to date Training in ATEC, we need and are requesting new up to date equipment. We currently need new 4-wheel alignment machines, Road force variation wheel balancers, tire mounting machines which all meet new vehicle manufacturer's requirements. The ATEC department also needs new machining equipment for Automotive Machining and Automotive Engine Rebuild/Repair. A Sunnen CV-20 Computer Enhanced Power hone for cylinder refinishing of the engine block at $60,000.00, a Sunnen align hone for cylinder block finishing, a Sunnen connecting rod hone for refinishing connecting rods at $15,000.00, 2 valve seat resurfacing kits and valve resurfacing equipment to meet manufacturers requirements. The ATEC department needs new training aids such as working engine displays available through outside vendors. ATEC also needs new torque wrenches and equipment to calibrate the torque wrenches.

The equipment will be used to train our students more effectively with up to date equipment and procedures required by the Automobile Manufacturers and Automotive Engine Rebuilders in our district an outside our district.

National Automotive Technician Educational Foundation (NATEF) has established a required tool lists for automotive repair trades. Auto Collision Repair and Paint (ACR/P) is

also working toward NATEF Certification. ACR/P has met with the tool room personnel and worked collaboratively to establish an inventory management protocol to track, maintain, repair, and restock the small tools inventory. Similarly, ATEC should be able to acquire and manage NATEF required tools.

C. Explain the long-range (2-4+ years) needs related to facilities and equipment. Provide a cost estimate for each need and explain how it will help the program better meet its goals.

Yearly review of current industry trends is a must allowing accurate future procurement plans. The automotive industry implements many changes in new models, attempting to impress buyers. Automobiles are incorporating many of the same functions as our cell phones. Automobiles of tomorrow will know who is in the driver's seat and will be able to respond to personal preferences in accommodations as well as being able to self-park and auto-navigate from here to a destination safely. The electronics, computer-controlled-interface, satellite communications, and data interpretation will be part of the new curriculum in the future. Teachers will be keeping up with technology and trends by attending seminars, reading journals, perusing magazines, learning new technologies, and examining the internet.

D. List any related recommendations

1. We have a logistics concern. We are not sure the moving contractor will be able to effectively relocate us in the new shop during the short time allocated. The shop relocation includes moving all Owner Provided Equipment (OPE) from the present to the new shop. The departments include ATEC, Auto Body, Air Conditioning, and Welding. Photos and dimensions were previously submitted to the architects and Land Lease, the coordinating contractor hired to maintain communication between ECC, and the various contractors. ATEC suggests developing an inventory list with those photos of each piece of equipment and a system of tagging all equipment with different colored tags representing each different department. This plan should minimize errors, confusion, equipment loss, and ensure accurate delivery of OPE to the correct location.

2. Develop and implement an annual review of industry developments, an audit of industrial advisors, gather information from ATEC Advisory Committee, and tie with procurement plans.

3. Develop a required tool list established by the National Automotive Technician Educational Foundation (NATEF) and compare the list with our present tool inventory. Included in the plan is the identification and removal of obsolete tools and equipment.

4. New building is anticipated to be equipped with new 4-wheel alignment machines, road force variation wheel balancers, tire mounting machines, machining equipment for

Automotive Machining and Automotive Engine Rebuild/Repair, a Sunnen CV-20 Computer Enhanced Power hone ($60,000), a Sunnen align hone, a Sunnen connecting rod hone ($15,000), two valve seat resurfacing kits, valve resurfacing machine, training aids, torque wrenches and torque wrenches calibrator. If these items do not get installed efforts will be made to secure funds to acquire this equipment.

6. Technology and Software

A. Describe and assess the adequacy and currency of the technology and software used by the program.

In the existing ATEC Department, students currently have access to three computers for vehicle information, vehicle diagnostics, and repair procedures. In the new building, we will have more computers for student to access. Currently, we have limited Alldata access. We would like to get more access to Alldata's website. Previously, we had access to Mitchel on Demand, another widely used automotive repair information provider. We would like to secure access to Mitchel on Demand website. The two web sites together will help to provide more diagnostic information and repair information for the students. These software addition requests have been submitted in Plan Builder for approval and funding.

B. Explain the immediate (1-2 years) needs related to technology and software. Provide a cost estimate for each need and explain how it will help the program better meet its goals.

The Automotive Department currently subscribes to Alldata. Alldata is used by students and faculty to acquire automotive repair information and repair procedures. However, Alldata does not cover all of the information and vehicles inclusively. The ATEC department needs an additional program to provide more coverage. This program is Mitchel on Demand and would help supplement the information found and used from Alldata. Alldata costs are at $2,500.00 a year. To subscribe to Mitchel on Demand will cost $5,000.00 to $6,000.00 and a yearly subscription fee of about $2,500.00 a year.

The ATEC needs more computers for the students to be able to access Alldata and Mitchel on Demand. Currently, the students are limited by the number of dedicated terminals as to how many students can access this information during class time. Rather than having terminals in lab, it might be feasible to establish an online library subscription might be the best alternative. ATEC faculty will investigate these alternatives.

C. Explain the long-range (2-4+ years) needs related to technology and software. Provide a cost estimate for each need and explain how it will help the program better meet its goals.

Engine performance enhancement is possible through the re-programming automobile onboard computers and computer chips. Vehicles can be programed to run leaner or richer fuel mixtures, to shift at higher or lower RPMs, or to retard timing to help with emissions or to conserve fuel use. The Automotive Department would like to have the

ability to re-program these computer chips. Students should be able to fine tune vehicle performance according to automobile manufacturers' recommendations. Reprogramming equipment is available through equipment suppliers at $8,000 to $15,000 per unit and reprogramming information is available from different manufacturers at a wide variety of cost structures. ATEC faculty will investigate and make prioritized recommendations and submit them in the ATEC Plan Builder (budget).

D. LIST ANY RELATED RECOMMENDATIONS.

1. We need more computers for student access, Alldata software access points, and in-depth access to Alldata's website. We need to reinstate access to Mitchel on Demand website information to complete access to automotive repair information. Alldata costs are at $2,500 a year. Cost of Mitchel on Demand subscription is $6,000 plus an annual subscription fee of $2,500. There is money in the budget to do this. It is a matter of setting priorities and following through with the justifications and budget requests.

2. Purchase Automobile CPU reprogramming equipment from equipment suppliers ($8,000 to $15,000) per unit. (See description in section C above.)

7. STAFFING

A. DESCRIBE THE PROGRAM'S CURRENT STAFFING, INCLUDING FACULTY, ADMINISTRATION, AND CLASSIFIED STAFF.

Previously there were four faculty members. One retired and not replaced. Currently, there are three full-time ATEC faculty members and two adjunct faculty members. Last year, two adjunct faculty members were hired. Another full-time faculty member retired. One of the part-time faculty members recently accepted a full-time position. Additional instructors will be required to meet industry and student needs and staff the department adequately.

In addition, student success and retention rates can be enhanced utilizing mentors/lab assistants. Lectures are easier to conduct than lab classes because the former reflects a single controlled group. Students studying in class as opposed to studying in lab do not have access to tools and equipment that have the potential for danger and trouble. Whereas, a lab class typically has more students simultaneously asking questions and requiring help. Lab classes require more attention from the instructor and lab assistants and should pay more than lecture classes. Moreover, industry advisors recommend that students get more lab experience.

Currently, ATEC has one tool room technician. Tool room attendants and technicians are required to support classes. Currently, we are unable to offer additional courses because we don't have lab support—tool room keepers and technicians. Tool room keepers are responsible for inventory management, security of tools, and ordering materials and supplies. In past years, a tool room staffing shortage, led to a decision to give instructors access to tool rooms. At first, it addressed the access problem, but the policy quickly degraded and contributed to inventory shrinkage and essentially made managing materials impossible. As a result, we need to staff accordingly to support the program now and in the future adding courses as required.

Department administration consists of a dean, an associate dean, an administrative assistant, a project specialist/budget person, and two clerical positions. This level of staffing would seem appropriate; however, they also have 15 other departments requiring their attention. Many of the functions supposedly conducted by faculty, such as scheduling and writing program reviews, are supported by administrative staff.

B. Explain and justify the program's staffing needs in the immediate (1-2 years) and long-term (2-4+ years). Provide cost estimates and explain how the position/s will help the program better meet its goals.

ATEC requires instructor replacements now. In one to two years, two more full-time faculty members will have retired. The problem with consistent understaffing and waiting until a position is vacant before filling is that institutional knowledge and continuity is lost. A wise administrative strategy is to allow overlapping teaching between the two groups. Opportunity is available for the many teaching and industry years of experiences to be shared. Mentoring of new instructors promotes program continuity during transitional entry and exit of faculty, especially when there are a significant percentage of retirees leaving (⅔ in this case). We have submitted requests to fill positions. We recognize that there are limited resources and that as an institution we are conservative and reluctant to over staff. That said, we have an immediate need to fill positions and these justifications have been relayed to management. We anticipate the retirement of two more full time instructors in 2014. Both will have 31 years at ECC and one with 41 years of cumulative teaching. We would like to see these positions filled.

Two full-time instructors would cost about $100,000 each. A tool room technician would cost about $60,000. The hiring of new faculty will help ATEC provide teaching continuity and sustain the program by providing the diverse course offerings offered in previous years 15 to 17 separate courses per semester which met student and district needs.

C. List any related recommendations

1. Request in Plan Builder to hire two full-time and two part-time faculty members, one full-time tool room technician, and two lab assistants and increase administrative staff to support programs.

2. Implement a policy to overlap personnel replacements. Hire replacements before retiring staff leaves.

8. Future Direction and Vision

A. Describe relevant changes within the academic field/industry. How will these changes impact the program in the next four years?

The faculty has spent many informal hours discussing the rapid technological evolution in the automotive industry. Teachers discussed alternative fuels, hybrids, and electric vehicles, which include, but are not limited to, compressed natural gas (CNG), diesel/biodiesel, hydrogen (HO), liquefied natural gas (LNG), solar power, integrated power/charging systems, Sterling engines, compressed air engines, and many fuel cell forms. Academic and industry changes require the ATEC program to continue observing new developments and to keep up with industry transitions and innovations.

Although there are many different fuel systems being employed today, a single pervasive power supplying infrastructure has yet to develop the likes of the gasoline economy of 1970s to support these modes. It is expensive to equip cars (hybrids) with multiple power generation and drive systems. It is also inefficient to have cars each equipped with limited efficiency generating engines. Consequently, the trend, more than likely, will be to equip automobiles with electric motors and distribute electricity to them. These types of cars would be quieter, more efficient, and less damaging to the environment. Fully electric transportation systems could be supported by distant, larger, more efficient, electrical generation and distribution systems that could generate electricity by many environmentally sustainable means.

Moreover, fully-automated control systems, self-driving cars are equipped with on board computers, electronics, and electrical power motor systems. These trends and observations tend to support electrical related automobile drive train and control system specialties.

B. Explain the direction and vision of the program and how you plan to achieve it.

One faculty member has obtained the ASE alternative fuel certification; trained in manufacturing biodiesel fuel, attended forty hour training on hybrid/electric vehicle technology, but has been unable to complete curriculum development tasks required to implement program improvements. The programs have remained relatively stagnate. It may appear that the ATEC program has not kept up with industry.

Another future direction is achieving the National Automotive Technician Education Foundation (NATEF) certification for automotive programs. This involved and labor/time intensive venture is achievable with proper school support. Earning this national certification leads to future donations from auto makers and other organizations.

Besides a brand new shop, the instructors will need to complete the following steps in order to obtain and keep the support for its ATEC program.

1. Obtain NATEF certification.

2. Re-evaluate the courses and develop a realistic and effective method of establishing a degree and certificate generating alternative fuel or electric vehicle program.

3. Currently the ATEC program supports separate 8-unit day classes and 4-unit night classes. These all require SLOs, assessments, and reviews. Efficiency would dictate that identical 3-unit modular courses that can be offered day or night would reduce the time spent on administration and permit time for course development. In this way, single modular courses could enhance existing courses and generate specialty certificates.

4. Purchase specialized tools and equipment to support NATEF requirements and alternative and electric powered vehicles.

A major reason this school did not consider teaching hybrid vehicles until now is the technology was too specialized for independent shops to undertake the repairs plus all repair problems were addressed at the dealers. Furthermore, only the most experienced dealership technicians could attend factory training and repair these cars. However, this scenario is changing.

Many hybrids are out of warranty, appearing in wrecking yards, and owners are finally seeking repairs at independent shops. The time has arrived for ATEC to implement a hybrid course. Organizing the course is easier than finding funding. However, using iconoclastic thinking, expensive equipment, tools, and components may be requested via donations from industry donors, some not even related directly with ATEC. Many years ago Fluke, a maker of electronic testing equipment donated two hand-held oscilloscopes upon our asking.

C. LIST ANY RELATED RECOMMENDATIONS

1. Obtain NATEF certification.

2. Re-evaluate the courses and develop a realistic and effective method of establishing a degree and certificate generating alternative fuel or electric vehicle program.

3. Evaluate day and night courses and determine if it is feasible to develop a single program of shorter, 3-4-unit, modular courses that could be applied uniformly to morning, afternoon, or evening students. Moreover, single modular courses could enhance existing courses and generate specialty certificates.

4. Purchase specialized tools and equipment to support NATEF requirements and alternative and electric powered vehicles.

9. PRIORITIZED RECOMMENDATIONS

A. PROVIDE A SINGLE, PRIORITIZED LIST OF RECOMMENDATIONS AND NEEDS FOR YOUR PROGRAM/DEPARTMENT (DRAWN FROM YOUR RECOMMENDATIONS IN SECTIONS 2-8). INCLUDE COST ESTIMATES AND LIST THE COLLEGE STRATEGIC INITIATIVE (SEE EL CAMINO WEBSITE) THAT SUPPORTS EACH RECOMMENDATION. USE THE FOLLOWING CHART FORMAT TO ORGANIZE YOUR RECOMMENDATIONS.

Priority	Recommendation	Estimate	Strategic Initiative
1	NATEF	$113,500	ABCDEF
	Obtain NATEF certification.	1,500	
	Develop a required tool list established by the National Automotive Technician Educational Foundation (NATEF) and compare the list with our present tool inventory. Included in the plan is the identification and removal of obsolete tools and equipment.	2,000	
	Purchase specialized tools and equipment to support NATEF requirements and alternative and electric powered vehicles.	110,000	
2	Curriculum Improvements	25,000	ABCDEF
	Review possibility of adding alternative fuels and electric to automotive program curriculum and develop implementation plan.		
	Investigate articulation agreement possibilities with CSULA and CSULB.		
3	Student Learning Outcomes	1,200	ABCDEF
	We are applying SLO assessments to recommendations, budget decisions, and program evaluations. We recommend periodic SLO assessment training updates to include these new applications and to maintain uniformity.		
4	Student Opportunities	200	ABCDEF
	Inform the students about financial aid opportunities and requirements. The textbooks are expensive. Many students cannot afford books. Consideration of rental textbooks at the Bookstore or textbook grants might be in order. Other programs with high fill rates have rented relatively expensive textbooks for about $20 per semester—a viable option for students.		
5	Classrooms and Logistics	600	ABCDEF
	We have a logistics concern. We are not sure the moving contractor will be able to effectively relocate us in the new shop during the short time allocated. The shop relocation includes moving all Owner Provided Equipment (OPE) from the present to the new shop. The departments include ATEC, Auto Body, Air Conditioning, and Welding. Photos and dimensions were previously submitted to the architects and Land Lease, the coordinating contractor hired to maintain communication between ECC, and the various contractors. ATEC suggests developing an inventory list		

Priority	Recommendation	Estimate	Strategic Initiative
	with those photos of each piece of equipment and a system of tagging all equipment with different colored tags representing each different department. This plan should minimize errors, confusion, equipment loss, and ensure accurate delivery of OPE to the correct location.		
	Secure additional classroom space. The number of lecture classrooms in the new shop is not adequate for the existing number of courses.		
6	Student tracking	1,000	ABCDEF
	Develop a strategy to track our graduates within the first year of leaving ECC, whether or not they achieved their educational goal. Self-addressed post cards with paid postage will encourage survey returns within the first year. Many students change their address and phone number but it is not forwarded to, or reflected in, our records.		
	Ask Institutional Research to investigate and provide student employment statistics.		
7	Industry Advisory	1,500	ABCDEF
	Develop and implement an annual review of industry developments, an audit of industrial advisors, and tie with procurement plans.		
8	Equipment	227,000	ABCDEF
	Purchase new 4-wheel alignment machines, road force variation wheel balancers, tire mounting machines, machining equipment for Automotive Machining and Automotive Engine Rebuild/Repair, a Sunnen CV-20 Computer Enhanced Power hone ($60,000), a Sunnen align hone, a Sunnen connecting rod hone ($15,000), two valve seat resurfacing kits, valve resurfacing machine, training aids, torque wrenches and torque wrenches calibrator.		
9	Software	23,500	ABCDEF
	We need more computers for student access, Alldata software access points, and in-depth access to Alldata's website. We need to reinstate access to Mitchel on Demand website information to complete access to automotive repair information. Alldata costs are at $2,500 a year. Cost of Mitchel on Demand subscription is $6,000 plus an annual subscription fee of $2,500.		
	Purchase Automobile CPU reprogramming equipment from equipment suppliers ($8,000 to $15,000) per unit.		
	Mitchel on Demand		
10	Staffing	260,000	ABCDEF
	Hire two full-time and two part-time faculty members, one full-time tool room technician, and two lab assistants and increase administrative staff to support programs.		
	Implement a policy to overlap personnel replacements. Hire replacements before retiring staff leaves.		
11	Curriculum	2,500	ABCDEF
	Re-evaluate the courses and develop a realistic and effective method of establishing a degree and certificate generating alternative fuel or electric vehicle program.		

Priority	Recommendation	Estimate	Strategic Initiative
	Evaluate day and night programs and determine if it is feasible to develop a single program of shorter, 3-unit, modular courses that could be applied uniformly to: day, afternoon, and evening students. Moreover, single modular courses could enhance existing courses and generate specialty certificates.		

B. EXPLAIN WHY THE LIST IS PRIORITIZED IN THIS WAY.

NATEF Certification is number one priority. It will give the program credibility and help graduates secure jobs and or transfer.

CAREER AND TECHNICAL SUPPLEMENTAL QUESTIONS

CTE programs must conduct a full program review every 4 years. The full review includes answering these supplemental questions. Every two years (once between full reviews) these supplemental questions must be answered and submitted to Academic Affairs for posting on the College website. Use labor market data, advisory committee input, and institutional data to respond to the following questions:

1. HOW STRONG IS THE OCCUPATIONAL DEMAND FOR THE PROGRAM?

There is always a demand for trained Automotive Technicians as shown in Occupational Employment chart Occupational Employment and Wages, May 2013 pgs 3-7. The ATEC department has seen and received requests by employers for trained technicians to fulfill their need for qualified technicians for their facilities.

2. HOW HAS THE DEMAND CHANGED IN THE PAST 5 YEARS AND WHAT IS THE OUTLOOK FOR THE NEXT 5 YEARS?

The ATEC program has noticed an increase of students desiring ATEC Training and an increase of repair facilities and dealer response needing qualified technicians.

EMSI estimates the 3,403 local county program completers in the areas of: Electronics installers and repairers (49-2093), Electronic equipment installer and repairers (49-2096), and Automotive service technicians and mechanics (49-3023) will find 812 current job postings and 1,385 job openings annually.

Over the past 5 years (2008 vs. 2013) ATEC jobs declined by a mere 4% in Southern California and the state. However, in Los Angeles County and El Camino College service area (7.5 mile radius); the number of jobs grew by 6%.

The demand over the next five years (2013 vs. 2018) seems solid, as job growth is expected to increase by 4% among Southern California, the state, and nation. Additionally, a growth rate of 3% is projected for Los Angeles County and the El Camino College Service Area (7.5 mile radius).

According to the Bureau of Labor Statistics (BLS), the job outlook looks promising as automobile ownership continues to increase which eventually leads to general maintenance and repairs, possibly creating more demand for entry-level mechanics. The BLS also notes that post-secondary training, particularly in advanced automotive technology (hybrid fuel or computer systems) will be beneficial and jobseekers with those skill sets will be preferred by employers over other candidates. Those lacking formal training will encounter stiff competition.

3. WHAT IS THE DISTRICT'S NEED FOR THE PROGRAM?

The District needs the ATEC program to help serve the community's needs for acquiring initial training and update training as the students and technicians are needed. The El Camino College District serves a very large demographic area and serves a large number of students. The District receives grants and money from the state and federal agencies to ensure that vocational programs are supported in the state of California and Los Angeles County. Smith/Hughes act, Perkins Gants, EDD, and TACCT Grants may help fund those needs.

4. WHAT IS THE STATE'S NEED FOR THE PROGRAM?

The State of California needs automotive and truck and bus technicians to maintain the growing fleets of vehicles in the cities, counties, and state. The State of California realizes the need for qualified technicians. Technicians are needed in automotive repair to help dealers maintain and repair vehicles. Vehicles that are maintained reduce fuel consumption, reduce vehicle failures, and reduce air pollution. Training facilities such as El Camino College provide trained workers to fill local community, municipality, city, county, and State positions.

Demand over the past 5 years (2008-2013):

Region	2008 Jobs	2013 Jobs	Change	% Change	Median Hourly Earnings
All Available Counties	48,428	46,531	(1,897)	(4%)	$16.83
State	81,703	78,536	(3,167)	(4%)	$17.85
Los Angeles County	21,155	19,843	(1,312)	(6%)	$15.50
Nation	772,126	766,371	(5,755)	(1%)	$16.49
7.5 mile zip radius	3,406	3,195	(211)	(6%)	$15.64

Occupation Breakdown - % Change (2008 vs. 2013):

Occupation	Description	All Available Counties	State	Los Angeles County	Nation	7.5 mile zip radius
49-3023	Automotive Service Technicians and Mechanics	(4%)	(4%)	(6%)	(1%)	(6%)
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	(5%)	(4%)	(7%)	(1%)	(4%)
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	(15%)	(16%)	(20%)	(9%)	(18%)
	Total	(4%)	(4%)	(6%)	(1%)	(6%)

Demand for next 5 years (2013-2018):

Region	2013 Jobs	2018 Jobs	Change	% Change	Median Hourly Earnings
All Available Counties	46,531	48,614	2,083	4%	$16.83
State	78,536	81,986	3,450	4%	$17.85
Los Angeles County	19,843	20,465	622	3%	$15.50
Nation	766,371	799,711	33,340	4%	$16.49
7.5 mile zip radius	3,195	3,293	98	3%	$15.64

5. How does the program address needs that are not met by similar programs in the region?

The Automotive Department serves the students in our local municipalities in the El Camino College district and other districts, because of the different in-depth courses and the variety of training courses offered in ATEC at El Camino College. We train the students to be ready for placement in an automotive repair shop, Automotive Dealership or an automotive machine shop and be able to work at an entry level to mid-level positions depending on the individual student's ability. Many students have been employed at the mid advance level to an advanced level of employment.

6. Are the students satisfied with their preparation for employment?

Collecting student satisfaction data has been challenging. And even if we could collect the information from the students, they do not have the experience yet to be able to report with the conviction of experience whether or not the training they received was adequate. The majority of students have not had years of experience in the job market to reflect and comment from their findings and experiences. However, anecdotally, students love our program and our instruction. Many of our students come back and join in our advisory committee meetings, and a few have come back to apply as teachers.

7. Are the employers in the field satisfied with the level of preparation of our graduates?

Anecdotally, employers love El Camino and fully support our program and our instruction. Surveys and advisory committees will help us determine the level of satisfaction. These inquiries will be suggested at future advisory meetings.

8. What are the completion, success, and employment rates for the students?

This is a listing of how many students have received Degrees from the ATEC program and how many students have received Certificates from the ATEC program. The number of degrees remains unchanged through the years. The number of certificates has almost quadrupled in the past 4 years. The ATEC department has a large number students who have completed the requirements for their certificates and the number of received certificates in 2012-2013 school year are second only to Fire & Emergency Medical Technician Program in acquiring certificates in the Industry Technology Division.

Completions for 2012-2013:

Associate	6
Certificate	58

Completions for 2011-2012:

Associate	6
Certificate	27

Completions for 2010-2011:

Associate	8
Certificate	14

Completions for 2009-2010:

Associate	8
Certificate	15

Completions for 2008-2009:

Associate	4
Certificate	26

9. What is the role of the advisory committee and what impact does it have on the program?

The role of Advisory Committee is to help advise the ATEC Instructors of new automotive trends and needs, recommendations of training, equipment, advancement, and Automotive changes to help improve the ATEC Program. The impact has not been as strong as it could be because many of the advisors are graduates or affiliated with the program. This last year, we invited manufacturer and dealer representatives from Honda and Toyota with the hope of broadening the scope and insightfulness of the attending advisors.

10. IF THERE IS A LICENSURE EXAM FOR STUDENTS TO WORK IN THEIR FIELD OF STUDY, PLEASE LIST THE EXAM AND THE PASS RATE. IF THERE ARE MULTIPLE LICENSURE EXAMS IN THE PROGRAM, INCLUDE THEM ALL.

There are no licensure exams currently offered at El Camino College for ATEC.

APPENDIX A: NATIONAL INDUSTRY WAGE DATA

Highest national published employment and wage areas.

Industry	Employment	Percent of industry employment	Hourly mean wage	Annual mean wage
Automotive Repair and Maintenance	225,500	26.90%	$17.28	$35,930
Automobile Dealers	208,380	18.62%	$20.89	$43,450
Automotive Parts, Accessories, and Tire Stores	62,180	12.09%	$16.43	$34,170
Gasoline Stations	19,230	2.25%	$16.87	$35,100
Local Government (OES Designation)	18,430	0.34%	$23.23	$48,320

The states with the highest published employment and wage rates.

State	Employment	Employment per thousand jobs	Location Quotient	Hourly mean wage	Annual mean wage
California	56,000	3.81%	0.83	$20.78	$43,220
Texas	45,950	4.21%	0.92	$18.39	$38,250
Florida	38,820	5.21	1.14	$17.83	$37,090
New York	34,160	3.96	0.87	$19.15	$39,820
Pennsylvania	31,930	5.68	1.25	$17.91	$37,260

APPENDIX B: SLOS, PLOS, ILOS AND ALIGNMENT GRIDS

Course Level SLOs	**Course to PLO Alignment**			**ILOs to Course SLOs Alignment** (Rate 1-4)					
	P1	P2	P3	I	II	III	IV	V	VI
ATEC 1 - Introduction to Automotive Service *SLO1 Safety Exam: Given an in-class exam, based on readings, classroom discussions and demonstrations, the student will be able to work in the Automotive Shop safely and pass the Automotive Safety Exam with 100% accuracy.		X		3	2	2	2	2	1
SLO2 Under Hood Inspection: The student will perform a vehicle under hood inspection and complete a Vehicle Under Hood Inspection lab sheet.		X		3	2	1	1	1	1
SLO3 Under Vehicle Inspection: The student will perform an under vehicle inspection and complete and Under Vehicle Inspection lab sheet.		X		3	2	1	1	1	1
ATEC 11 - Brakes, Suspension, and Four Wheel Alignment *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Brake System Inspection: The student will perform a brake system inspection on a vehicle and complete a Vehicle Brake Inspection lab worksheet.	X	X	X	4	3	1	1	1	1
SLO3 Suspension Inspection: The student will perform a front and rear suspension inspection on a vehicle and complete a Vehicle Suspension Inspection lab sheet.	X	X	X	4	3	1	1	1	1
ATEC 14 - Brakes: *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Brake Inspection: The student will perform a brake system inspection on a vehicle and complete a Vehicle Brake Inspection lab sheet.	X	X	X	4	3	1	1	1	1
SLO3 Drum Brake Service & Adjustment: The student will perform a drum brake system service and adjustment and complete a Vehicle Brake Service lab sheet.	X	X	X	4	3	1	1	1	1
ATEC 16 - Suspension and Four Wheel Alignment *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Suspension Inspection: The student will perform a front and rear suspension inspection on a vehicle and complete a Vehicle Suspension Inspection lab sheet.	X	X	X	4	3	1	1	1	1
SLO3 Four Wheel Alignment: The student will perform a four-wheel alignment on a vehicle and complete a 4-Wheel Alignment Data lab sheet.	X	X	X	4	3	1	1	1	1

Course Level SLOs	Course to PLO Alignment			ILOs to Course SLOs Alignment (Rate 1-4)					
	P1	P2	P3	I	II	III	IV	V	VI
ATEC 21 - Introduction to Engine Tune-Up *SLO1 Safety Exam: See safety exam ATEC1	X	X		4	3	2	2	2	1
SLO2 Engine Analysis: The student will perform and analysis of an engine using the Automotive Compression/ Cylinder Leakage Test /Vacuum Testing lab worksheet to manufacturer specifications.	X	X	X	4	3	1	1	1	1
SLO3 Battery System Test: The student will be able to test the performance of the automotive battery charging and starting systems using the Automotive Battery/ Charging/Starting Systems Testing lab worksheet and manufacturer specifications.	X	X	X	4	3	1	1	1	1
ATEC 22A - Introduction to Tune-Up, Electrical and Fuel Systems *SLO1 Safety Exam: See safety exam ATEC1.	X	X	X	4	3	2	2	2	1
SLO2 Engine Analysis: The student will perform an analysis of an engine using the Automotive Compression/ Cylinder Leakage Test/ Vacuum Testing lab worksheet to manufacturer specifications.	X	X	X	4	3	1	1	1	1
SLO3 Engine Condition & Performance: The student will test and evaluate engine condition and performance using an Engine Analyzer/ Scanner lab worksheet to manufacturer specifications.	X	X	X	4	3	1	1	1	1
SLO4 Fuel System Test: The student will be able to test the performance of an automotive fuel system using the Fuel System Performance Testing lab worksheet and manufacturer specifications.	X	X	X	4	3	1	1	1	1
ATEC 22B - Advanced Tune-Up, Electrical and Fuel Systems *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Battery System Test: The student will be able to test the performance of the automotive battery charging and starting systems using the Automotive Battery/ Charging/ Starting Systems Testing lab worksheet and manufacturer specifications.	X	X	X	4	3	1	1	1	1
SLO3 Powertrain Control Module: The student will be able to test the performance of the automotive computer controlled system using the Automotive Powertrain Control Module Data lab worksheet and manufacturer specifications.	X	X	X	4	3	1	1	1	1
ATEC 23 Major Tune-Up and Emission Controls *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Engine Analysis: The student will perform an analysis of an engine using the Automotive Compression/ Cylinder Leakage Test/ Vacuum Testing lab worksheet to manufacturer specifications.	X	X	X	4	3	1	1	1	1
SLO3 Engine Condition & Performance: The student will test and evaluate engine condition and performance using an Engine Analyzer / Scanner lab worksheet to manufacturer specifications.	X	X	X	4	3	1	1	1	1

Course Level SLOs	Course to PLO Alignment			ILOs to Course SLOs Alignment (Rate 1-4)					
	P1	P2	P3	I	II	III	IV	V	VI
ATEC 24 Fuel Systems and Emissions *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Engine Condition & Performance: The student will test and evaluate engine condition and performance using an Engine Analyzer / Scanner lab worksheet to manufacturer specifications.	X	X	X	4	3	1	1	1	1
SLO3 Fuel System Test: The student will be able to test the performance of an automotive fuel system using the Fuel System Performance Testing lab worksheet and manufacturer specifications.	X	X	X	4	3	1	1	1	1
ATEC 25 Automotive Electrical Systems *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Battery System Test: The student will be able to test the performance of the automotive battery charging and starting systems using the Automotive Battery/ Charging/ Starting Systems Testing lab worksheet and manufacturer specifications.	X	X	X	4	3	1	1	1	1
SLO3 Engine Condition & Performance: The student will test and evaluate engine condition and performance using an Engine Analyzer / Scanner lab worksheet to manufacturer specifications.	X	X	X	4	3	1	1	1	1
ATEC 26 Automotive Testing and Diagnosis *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Powertrain Control Module: The student will be able to test the performance of the automotive computer controlled system using the Automotive Powertrain Control Module Data lab worksheet and manufacturer specifications.	X	X	X	4	3	1	1	1	1
SLO3 Engine Condition & Performance: The student will test and evaluate engine condition and performance using an Engine Analyzer / Scanner lab worksheet to manufacturer specifications.	X	X	X	4	3	1	1	1	1

Course Level SLOs	Course to PLO Alignment			ILOs to Course SLOs Alignment (Rate 1-4)					
	P1	P2	P3	I	II	III	IV	V	VI
ATEC 33 Transmissions, Drive Train and Drive Axles *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Automatic Transmission Inspection: The student will inspect, test, and evaluate operation of an automatic transmission using manufacturer testing procedures and specifications.	X	X	X	4	3	1	1	1	1
SLO3 Manual Transmission Inspection: The student will inspect, test, and evaluate operation of a manual transmission using manufacturer testing procedures and specifications.	X	X	X	4	3	1	1	1	1
SLO4 Manual Transmission Performance: The student will disassemble, inspect, measure and evaluate the parts of a manual transmission, then reassemble and test the transmission using manufacturer procedures and specifications.	X	X	X	4	3	1	1	1	1
SLO5 Automatic Transmission Performance: The student will disassemble, inspect, measure and evaluate the parts of an automatic transmission, then reassemble and test the automatic transmission using manufacturer procedures and specifications.	X	X	X	4	3	1	1	1	1
ATEC 34 -Automatic Transmissions *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Automatic Transmission Inspection: The student will inspect, test, and evaluate operation of an automatic transmission using manufacturer testing procedures and specifications.	X	X	X	4	3	1	1	1	1
SLO3 Automatic Transmission Performance: The student will disassemble, inspect, measure and evaluate the parts of an automatic transmission, then reassemble and test the automatic transmission using manufacturer procedures and specifications.	X	X	X	4	3	1	1	1	1
ATEC 35 Manual Transmission, Drive Train and Drive Axles *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Manual Transmission Inspection: The student will inspect, test, and evaluate operation of a manual transmission using manufacturer testing procedures and specifications.	X	X	X	4	3	1	1	1	1
SLO3 Manual Transmission Performance: The student will disassemble, inspect, measure and evaluate the parts of a manual transmission, then reassemble and test the transmission using manufacturer procedures and specifications.	X	X	X	4	3	1	1	1	1

Course Level SLOs	Course to PLO Alignment			ILOs to Course SLOs Alignment (Rate 1-4)					
	P1	P2	P3	I	II	III	IV	V	VI
ATEC 41 - Engine Rebuilding *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Cylinder Head Recondition: The student will recondition an automotive cylinder head using manufacturer procedures and specifications, then complete a lab sheet.	X	X	X	4	3	1	1	1	1
SLO3 Engine Inspection & Test: The student will disassemble, inspect, measure and evaluate the parts of an automotive engine, then reassemble and test the engine using manufacturer procedures and specifications.	X	X	X	4	3	1	1	1	1
ATEC 42 - Engine Repair *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Engine Analysis: The student will perform an analysis of an engine to manufacturer specifications and complete Automotive Compression/ Cylinder Leakage Test/ Vacuum and Oil Pressure lab worksheets.	X	X	X	4	3	1	1	1	1
SLO3 Cooling System Analysis: The student will test and analyze an automotive engine cooling system using manufacturer procedures and specifications, then complete a lab sheet.	X	X	X	4	3	1	1	1	1
ATEC 43 - Introduction to Engine Repair *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Engine Analysis: The student will perform an analysis of an engine to manufacturer specifications and complete Automotive Compression/ Cylinder Leakage Test/ Vacuum and Oil Pressure lab worksheets.	X	X	X	4	3	1	1	1	1
SLO3 Cooling System Analysis: The student will test and analyze an automotive engine cooling system using manufacturer procedures and specifications, then complete a lab sheet.	X	X	X	4	3	1	1	1	1
ATEC 45 Automotive Machining *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 Cylinder Head Recondition: The student will recondition an automotive cylinder head using manufacturer procedures and specifications, then complete a lab sheet.	X	X	X	4	3	1	1	1	1
SLO3 Machining Engine Components: The student will measure, inspect and analyze automotive components with precision instruments, perform varied machine work as required to recondition the components using manufacturer procedures and specifications, and complete a lab sheet.	X	X	X	4	3	1	1	1	1
ATEC 81 Automotive Air Conditioning *SLO1 Safety Exam: See safety exam ATEC1	X	X	X	4	3	2	2	2	1
SLO2 A/C System Analysis: The student will perform an analysis of automotive system using an air conditioning gauge set to manufacturer specifications and complete a lab sheet.	X	X	X	4	3	1	1	1	1
SLO3 Evacuation & Recharge: The student will perform an evacuation and recharge of the refrigerant from the automotive air conditioning system according to industry standards and complete a lab sheet.	X	X	X	4	3	1	1	1	1

APPENDIX C: GRADE DISTRIBUTION BY YEAR.

Automotive Technology				Grade Distribution											Total	Successful	Retained	Success Rate	Retention Rate
Year	Course	Method	Weeks	'A'	'B'	'C'	'P'	'D'	'F'	'NP'	Inc P	Inc NP	'DR'	'W'					
2009	ATEC-1	Lecture	16	36	9	4	-	3	5	-	-	-	3	29	***89***	49	57	55.1%	**64.0%**
2009	ATEC-14	Lecture	16	8	7	5	-	1	1	-	-	-	1	4	***27***	20	22	74.1%	81.5%
2009	ATEC-21	Lecture	16	7	7	1	-	1	1	-	-	-	2	3	***22***	15	17	68.2%	77.3%
2009	ATEC-22A	Lecture	16	6	5	5	-	1	1	-	-	-	1	2	***21***	16	18	76.2%	85.7%
2009	ATEC-22B	Lecture	16	1	1	6	-	1	-	-	-	-	-	2	***11***	8	9	72.7%	81.8%
2009	ATEC-26	Lecture	16	7	9	1	-	-	-	-	-	-	1	-	***18***	17	17	*94.4%*	94.4%
2009	ATEC-33	Lecture	16	6	11	6	-	2	1	-	-	-	-	5	***31***	23	26	74.2%	83.9%
2009	ATEC-41	Lecture	16	3	4	7	-	3	3	-	-	-	3	6	***29***	14	20	**48.3%**	69.0%
2009	ATEC-45	Lecture	16	4	7	1	-	-	1	-	-	-	4	1	***18***	12	13	66.7%	72.2%
Total				78	60	36	-	12	13	-	-	-	15	52	***266***	174	199	65.4%	74.8%
2010	ATEC-1	Lecture	16	47	2	8	-	-	5	-	-	-	-	23	***85***	57	62	67.1%	72.9%
2010	ATEC-21	Lecture	16	1	4	6	-	2	9	-	-	-	1	4	***27***	11	22	**40.7%**	81.5%
2010	ATEC-22A	Lecture	16	3	7	3	-	3	3	-	-	-	-	-	***19***	13	19	68.4%	*100.0%*
2010	ATEC-22B	Lecture	16	3	-	5	-	-	1	-	-	-	-	-	***9***	8	9	*88.9%*	*100.0%*
2010	ATEC-24	Lecture	16	11	3	3	-	-	2	-	-	-	1	2	***22***	17	19	77.3%	86.4%
2010	ATEC-33	Lecture	16	6	4	5	-	3	-	-	-	-	3	5	***26***	15	18	57.7%	69.2%
2010	ATEC-41	Lecture	16	2	7	11	-	2	-	-	-	1	-	4	***27***	20	23	74.1%	85.2%
2010	ATEC-43	Lecture	16	11	2	3	-	2	1	-	-	-	1	7	***27***	16	19	59.3%	70.4%
Total				84	29	44	-	12	21	-	-	1	6	45	***242***	157	191	64.9%	78.9%
2011	ATEC-1	Lecture	16	50	5	8	-	1	4	-	-	-	8	13	***89***	63	68	70.8%	76.4%
2011	ATEC-14	Lecture	16	3	8	8	-	1	2	-	-	-	3	5	***30***	19	22	63.3%	73.3%
2011	ATEC-21	Lecture	16	9	5	3	-	2	1	-	-	-	1	4	***25***	17	20	68.0%	80.0%
2011	ATEC-22A	Lecture	16	2	3	4	-	7	-	-	-	-	-	4	***20***	9	16	**45.0%**	80.0%
2011	ATEC-22B	Lecture	16	6	2	2	-	-	-	-	-	-	-	-	***10***	10	10	*100.0%*	*100.0%*
2011	ATEC-26	Lecture	16	8	5	4	-	1	1	-	-	-	-	-	***19***	17	19	*89.5%*	*100.0%*
2011	ATEC-33	Lecture	16	14	9	-	-	2	1	-	-	-	-	1	***27***	23	26	85.2%	96.3%
2011	ATEC-41	Lecture	16	9	5	2	-	2	-	-	1	-	-	4	***23***	17	19	73.9%	82.6%
Total				101	42	31	-	16	9	-	1	-	12	31	***243***	175	200	72.0%	82.3%
2012	ATEC-1	Lecture	16	12	1	-	-	-	-	-	-	-	-	14	***27***	13	13	**48.1%**	**48.1%**
2012	ATEC-16	Lecture	16	9	9	1	-	1	-	-	-	-	-	4	***24***	19	20	79.2%	83.3%
2012	ATEC-22A	Lecture	16	1	9	4	-	4	1	-	-	-	-	-	***19***	14	19	73.7%	*100.0%*
2012	ATEC-22B	Lecture	16	2	5	2	-	1	-	-	-	-	-	-	***10***	9	10	*90.0%*	*100.0%*
2012	ATEC-24	Lecture	16	16	4	1	-	-	-	-	-	-	-	3	***24***	21	21	87.5%	87.5%
2012	ATEC-33	Lecture	16	9	9	3	-	-	3	-	-	-	-	3	***27***	21	24	77.8%	88.9%
2012	ATEC-41	Lecture	16	1	5	5	-	4	7	-	-	-	-	3	***25***	11	22	**44.0%**	88.0%
Total				50	42	16	-	10	11	-	-	-	-	27	***156***	108	129	69.2%	82.7%
Total	4 Years			313	173	127	-	50	54	-	1	1	33	155	907	614	719	67.7%	79.3%
2009-	-2012	Average		78	43	32	-	13	14	-	0	0	8	39	227	154	180	67.7%	79.3%