

# ADVANCED TRANSPORTATION TECHNOLOGY – ALTERNATIVE FUELS

## Curriculum Guide for Academic Year 2016-2017

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Students planning to **transfer** to a four-year college or university should refer to the ASSIST web site at [www.assist.org](http://www.assist.org) and **consult a counselor** before beginning a program of study. Please call 562-938-4561 for the LAC, or (562) 938-3920 for PCC to set up a meeting with a counselor. Students may also wish to visit the Transfer Center on either campus.

### Program of study leading to: Associate in Science (A.S.) Degree

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
ATT 490	Introduction to Alternative Fuels	3.5		
ATT 491	Heavy Duty Alternative Fuels	3.5		
ATT 492	Heavy Duty Alternative Fuel Diagnosis and Repair	3.5		
ATT 493	Alternative Fuel Conversion, Diagnosis and Repair	3.5		
<b>Subtotal Units</b>		<b>14</b>		
<b><u>IN ADDITION, complete at least FOUR (4) units from the following:</u></b>				
AC_R 236A	Automobile Air Conditioning	2.5		
AMECH 438	Auto Emission Control (F-night)	6		
AMECH 461	A-1 Engine Repair Specialty	6		
ATT 480	Intro to Hybrid & Electric Vehicles	3.5		
ATT 481	Advanced Hybrid & Electric Vehicles	3.5		
ATT 483	Advanced Hybrid Diagnosis & Repair	3.5		
DIESL 391B	Heavy Equipment Electrical Systems	5		
DIESL 293	General Engines	4		
FORK 801	Forklift Safety and Operation	1		
MTFAB 50	Introduction to Metalworking	4		
WELD 50	Introduction to Welding	4		
<b>Subtotal Units</b>		<b>4-6</b>		
<b>TOTAL UNITS</b>		<b>18-20</b>		

**REQUIRED FOR THE COMMUNICATION & ANALYTICAL THINKING General Education component:**  
 Math Requirement: Complete Math 120<sup>#</sup> or 130<sup>#</sup> or 130A<sup>#</sup> OR a more advanced level of Mathematics<sup>#</sup>.

**RECOMMENDED for the NATURAL SCIENCES General Education component:**  
 ENVRS 1 (Energy for the Future) OR CHEM 2

**A.S. requirements continue on following page.**

**A.S. requirements continued from previous page.**

For graduation with an **Associate in Science (A.S.) Degree with a major in Advanced Transportation Technology-Alternate Fuels:**

- Minimum Unit Requirements:** §Any course that appears on a curriculum guide and the General Education Pattern (Plan A) may fulfill both major and general education requirements (Approved by College Curriculum Committee Spring 2012). For this degree, complete a minimum of 60 units in courses numbered 1-599. Please note that additional elective units may be required to meet this minimum based upon courses selected to fulfill General Education for the Associate Degree.

**ATT-Alt. Fuels Major:** 18 - 20 units  
**General Education/A.S. §** 19 units

- Scholarship:** Maintain an **overall grade point average (GPA) of 2.0** ("C" average) based on all accredited college work applied to the degree, no matter where completed. For this **field of concentration, complete each course above with a grade of "C" or better**, or "P" if course is graded on a P/NP basis.
- Residence for the Degree:** Complete at least 30 units of the required 60 in residence at LBCC, or complete in residence at LBCC at least 20 units within the last 30 units of work applied to the degree.
- Residence for the Field of Concentration:** Complete fifty percent (50%) or more of the unit requirements for this field of concentration in residence; this means **at least 9-10 units** of the required 18-20 must be **completed at Long Beach City College**. Credit earned by exam, where applicable, may be included.
- General Education and Proficiency Requirements:** Complete the required A.A./A.S. General Education and Proficiency requirements\*, otherwise known as "Plan A". For Plan A requirements, refer to the general catalog or view it online at <http://osca.lbcc.edu>.
- Complete and submit the degree application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at <http://admissions.lbcc.edu/>. Refer to the Schedule of Classes (<http://schedule.lbcc.edu>) and click the "Important Dates" link to view the actual deadline for each semester.

\*The requirements for general education/proficiency and the field of concentration (major) need to be from the same catalog year. This catalog year may be any year between the year of initial enrollment to the present, provided continuous enrollment is maintained throughout. See the catalog for definition of "continuous enrollment".

**Program of study leading to:  
Certificate of Achievement:**

**REQUIRED COURSES—Complete the FOURTEEN (14 units) of required courses as listed in the Associate Degree requirements box on the first page.**

<u>REQUIRED COURSES</u>	TOTAL UNITS	14	In Progress	Completed
<b>IN ADDITION, Complete SIX (6 units) from the courses below:</b>				
ATT 801	Quick Service Tech – Lubrication Service	2		
ATT 802	Quick Service Tech – Tire Service	2		
ATT 803	Quick Service Tech – Brake Inspection	2		
	SUB TOTAL	<b>6</b>		
	TOTAL	<b>20</b>		

For graduation with an **Advanced Transportation Technology-Electric Vehicles Certificate of Achievement:**

- Complete each of the **REQUIRED COURSES** listed above with a **minimum grade of "C"**.
- Complete fifty percent (50%) or more of the unit requirements for this field of concentration in residence; this means **at least 10 units** of the required 20 must be **completed at Long Beach City College**. Credit earned by exam, where applicable, may be included.

Complete and submit the certificate application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office online at <http://admissions.lbcc.edu/>. Refer to the Schedule of Classes (<http://schedule.lbcc.edu>) and click the "Important Dates" link to view the actual deadline for each semester.

**Suggested Sequence of Classes**

This is not an educational plan, as course offerings, student schedules, and circumstances vary. Students must meet all the prerequisites in order to be eligible for the sequence of courses.

A suggested sample sequence of courses for the program includes:

<b><u>First Semester</u></b> ATT 490 OR 491	<b><u>Units</u></b> 3.5	<b><u>Second Semester</u></b> ATT 491 OR 490 (whichever not taken first semester)	<b><u>Units</u></b> 3.5
<b><u>Third Semester</u></b> ATT 492 OR 493	3.5	<b><u>Fourth Semester</u></b> ATT 492 OR 493 (whichever not taken third semester)	3.5

NOTE: Electives can be taken in any semester. The number of elective units required depends on the selected electives.

**Program of study leading to:  
Certificate of Accomplishment**

**Certificate: Advanced Transportation Technology—Light-Medium Duty Alternate Fuels 4102**

<b><u>REQUIRED COURSES</u></b>		<b>UNITS</b>	<b>In Progress</b>	<b>Completed Grade</b>
ATT 490	Introduction to Alternative Fuels	3.5		
ATT 493	Alt. Fuels Conversion, Diagnosis & Repair	3.5		
<b>TOTAL UNITS</b>		<b>7</b>		

**Certificate: Advanced Transportation Technology—Heavy Duty Alternate Fuels 4104**

<b><u>REQUIRED COURSES</u></b>		<b>UNITS</b>	<b>In Progress</b>	<b>Completed Grade</b>
ATT 491	Heavy Duty Alternative Fuels	3.5		
ATT 492	Heavy Duty Alt. Fuel Engine Diagnosis & Repair	3.5		
<b>TOTAL UNITS</b>		<b>7</b>		

For graduation with a **Certificate of Accomplishment**:

1. Complete the above required units with a minimum grade point average of 2.0 ("C" average).
2. Fifty percent (50%) or more of the required units must be completed in residence at LBCC.
3. Complete and submit the certificate application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at <http://admissions.lbcc.edu/>.

**Career Opportunities**

The certificate and degree programs will prepare students for an entry-level position as a light/medium and heavy duty technician in such fields as car, bus, truck, and specialty equipment diagnosis and repair industry. Students prepare for a career in alternative fuel vehicle conversion, maintenance and repair using state-of-the-art-equipment. Computerized engine management is emphasized.

**Program Mission and Outcomes**

The mission of the Alternative Fuels Program is to provide students with state of the art training in servicing and maintaining Alternative Fueled vehicles in the light/medium and Heavy Duty engine platforms leading to a certificate and/or an AS Degree in Alternative Fuels.

- Safely work on the high voltages present in Electric Vehicles without injury.
- Diagnose and repair computer controlled electric vehicles installations and inspections of systems and their related components.
- Compare the differences, advantages, and limitations of the various electric vehicles to determine proper application of each technology.

**Legend**

† This course has a prerequisite. Prerequisite courses must be complete with at least a "C" or "P" grade. Refer to the General Catalog (<http://www.lbcc.edu/cat/index.html>), the Schedule of Classes (<http://schedule.lbcc.edu/>), or the online Credit Course Outline (<http://wdb-asir.lbcc.edu/coursecurriculum/coursestetails/>) for specific prerequisite information.