

ADVANCED TRANSPORTATION TECHNOLOGY – ELECTRIC VEHICLES

Curriculum Guide for Academic Year 2014-2015

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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 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 schedule 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 480	Hybrid, Fuel Cell, & Electric Vehicles	3.5	<input type="text"/>
ATT 481	Advanced Hybrid & Fuel Cell Electric Vehicles	3.5	<input type="text"/>
ATT 483	Electric Vehicle Projects	3.5	<input type="text"/>
ATT 490	Introduction to Alternative Fuels	3.5	<input type="text"/>
Subtotal Units		14	<input type="text"/>
<u>IN ADDITION, complete SIX (6) units from the following:</u>			
ABODY 211	Introduction to Basic Auto Body Repair	9	<input type="text"/>
ABODY 240	Automotive Refinishing I	5	<input type="text"/>
ABODY 419	Auto Body Repair	4	<input type="text"/>
AC_R 236A	Automotive Air Conditioning	2.5	<input type="text"/>
AMECH 233	Auto Electrical & Fuel Systems (F)	9	<input type="text"/>
AMECH 236	Automotive Emissions & Computer Control (SP)	9	<input type="text"/>
AMECH 421	Auto Mechanics I	3	<input type="text"/>
AMECH 430	Auto Wheel Alignment	6	<input type="text"/>
AMECH 438	Auto Emission Controls (F - night)	6	<input type="text"/>
AMECH 440	Automotive Computer Systems (SP - night)	6	<input type="text"/>
AMECH 444	Automotive Electrical Systems (SP - night)	6	<input type="text"/>
ATT 491	Heavy Duty Alternative Fuels	3.5	<input type="text"/>
ATT 492	H D Alt Fuel Engine Diagnosis & Repair	3.5	<input type="text"/>
ATT 493	Alt Fuels Conversion, Diagnosis & Repair	3.5	<input type="text"/>
AMECH 50A	Machine Tool	3	<input type="text"/>
AMECH 432	Automotive Brake System	6	<input type="text"/>
AMECH 434	Engine Repair	6	<input type="text"/>
AMECH 436	Automatic & Standard Transmission	6	<input type="text"/>
AMECH 424	Auto Air Conditioning	3	<input type="text"/>
DIESL 391B	Heavy Equipment Electrical Systems	5	<input type="text"/>
FORK 801	Forklift Safety and Operation	1	<input type="text"/>
MTFAB 50	Metal Fabrication	4	<input type="text"/>
WELD 50	General Welding	4	<input type="text"/>
Subtotal Units		6	<input type="text"/>
TOTAL UNITS		20	<input type="text"/>

Associate Degree requirements continue on following page:

Associate Degree requirements continued from previous page.

REQUIRED FOR THE COMMUNICATION & ANALYTICAL THINKING General Education component:

Math Requirement: Complete Math †120 or †130 or †130A OR a more advanced level of Mathematics.

RECOMMENDED for the NATURAL SCIENCES General Education component:

ENVRS 1 (Energy for the Future) OR †CHEM 2

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

1. **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-Elect. Vehicles Major 20 units
General Education/A.S. § 19 units

2. **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.
3. **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.
4. **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 10 units** of the required 20 must be **completed at Long Beach City College**. Credit earned by exam, where applicable, may be included.
5. **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> .
6. 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 20 units of required courses as listed in the Associate Degree requirements box on the first page.

REQUIRED COURSES

		In	
		Progress	Completed
TOTAL UNITS	20	<input type="text"/>	<input type="text"/>

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

1. Complete each of the **REQUIRED COURSES** listed above with a **minimum grade of "C"**.
2. 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.
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/> . 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:

<u>First Semester</u>	<u>Units</u>	<u>Second Semester</u>	<u>Units</u>
ATT 490 OR AMECH 480	3.5	ATT 490 OR AMECH 480 (whichever not taken first semester)	3.5
<u>Third Semester</u>		<u>Fourth Semester</u>	
AMECH 481 OR 483	3.5	ATT 481 OR 483 (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—Electric Vehicle 4100

<u>REQUIRED COURSES</u>	UNITS	In Progress	Completed Grade
ATT 480 Hybrid, Fuel Cell, & Electric Vehicles	3.5		
ATT 481 Advanced Hybrid & Fuel Cell Electric Vehicles	3.5		
TOTAL UNITS	7		

*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 Hybrids, fuel cells, and electric vehicle conversion, maintenance and repair using state-of-the-art equipment.

Program Mission and Outcomes

The mission of the Electric Vehicle Program is to provide students with state of the art training in servicing and maintaining Electric Vehicles leading to a Certificate and/or an AS Degree in Electric Vehicles.

Outcomes:

- Ability to safely work on the high Voltages present in Electric Vehicles without injury.
- Ability to diagnose and repair computer controlled Electric Vehicles including hybrids, fuel cells, and plug in electrics, regarding installations and inspections of systems and their related components.
- Ability to 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/coursedetails/>) for specific prerequisite information.