

# AIR CONDITIONING/REFRIGERATION

## Curriculum Guide for Academic Year 2012-2013

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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 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**

<b><u>REQUIRED COURSES</u></b>		<b>UNITS</b>	<b>In Progress</b>	<b>Completed Grade</b>
AC_R 220	Refrigeration Fundamentals	3		
AC_R 223	Gas Heating Fundamentals	3		
AC_R 226	Air Properties and Measurement	2		
AC_R 229	Heat Pumps	3		
AC_R 230	Electrical Fundamentals	3		
AC_R 233	Commercial Electrical for HVAC	3		
AC_R 240	Advanced Air Conditioning	4		
AC_R 421A	Automatic Controls for HVAC	3		
<b>Subtotal Units</b>		<b>24</b>		
<b><u>IN ADDITION, complete SIX (6) units from</u></b>		<b>UNITS</b>	<b>In Progress</b>	<b>Completed Grade</b>
AC_R 421B	Automatic Controls for Refrig., Air Conditioning & Heating	3		
AC_R 422	Air Conditioning System Design & Installation	3		
AC_R 400A	Uniform Mechanical Code I	3		
AC_R 400B	Uniform Mechanical Code II	3		
AC_R 450A	Transport Refrigeration	5		
AC_R 450B	Advanced Transport Refrigeration	5		
AC_R 260	Solar Hot Water Heating	3		
AC_R 271AD OR	Work Experience-Air Cond. & Refrigeration	2 OR		
272AD OR	MAX 4 Units	3 OR		
273AD		4		
FORK 801	Forklift Safety & Operation	1		
<b>Subtotal Units</b>		<b>6</b>		
<b>TOTAL UNITS</b>		<b>30</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>.

*Associate Degree requirements continue on following page.*

**Associate Degree requirements continued from previous page.**

For graduation with an **Associate in Science (A.S.) Degree with a major in Air Conditioning/Refrigeration-Theory & Practical Experience:**

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.

**A/C Refrig. Theory & Prac. Major:** 30 units  
**General Education/A.S.** 19 units  
**Minimum Total Units:** 60 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 15 units** of the required 30 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 30 units of required courses as listed in the Associate Degree requirements box on the first page.

<u>REQUIRED COURSES</u>	TOTAL UNITS	In	
		Progress	Completed
	30	<input type="text"/>	<input type="text"/>

For graduation with a **Air Conditioning/Refrigeration Theory and Practical Experience 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 15 units** of the required 30 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.

**Career Opportunities**

Students prepare for entry-level positions in air conditioning and refrigeration. The program includes H.V.A.C.R. (Heating, Ventilation, Air Conditioning, and Refrigeration) technology for commercial and industrial applications. Emphasis will be placed on training an individual to have the theory and manipulative skills that will enable that person to be a productive member of the air conditioning and refrigeration industry.

## Program Mission and Outcomes

The Refrigeration & Air Conditioning Technology program's mission is to provide technical training to meet the demands of the industry and the needs of the individual to provide employment and the capacity to attain career success in Air Conditioning/Refrigeration; and a sense of professional responsibility.

Outcomes:

- Perform service and repair tasks identified by the North America Technician Excellence (NATE).
- Perform industry standard diagnostic information to repair complex air conditioning problems using standard test equipment.
- Demonstrate safe and efficient competence with electrical, refrigerant, air flow, and environmental test equipments used in the HVAC industry.

## 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.