

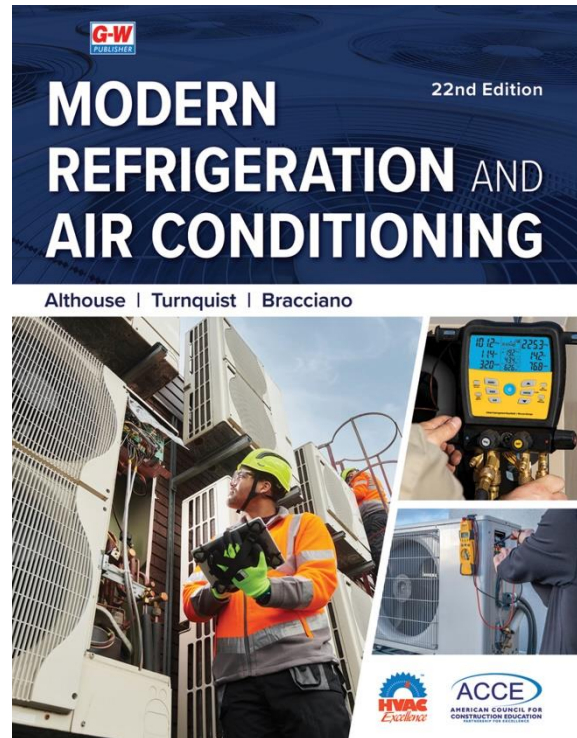


**Correlation of**  
**Modern Refrigeration and Air Conditioning**, by Althouse, Turnquist, Bracciano  
 (Goodheart-Willcox Publisher ©2025)  
 to  
**HVAC Excellence Competencies Task List: General Studies**

The following chart correlates the *Modern Refrigeration and Air Conditioning* textbook (©2025) to an area of the HVAC Excellence Competencies Task List.

The chart lists individual competency and task standards, and the corresponding chapter numbers from *Modern Refrigeration and Air Conditioning*.

For more information on HVAC Excellence and related certifications, please visit:  
[www.hvacexcellence.org](http://www.hvacexcellence.org).



Competency/Task	Textbook Chapter(s)
<b>Mathematics for HVACR</b>	
<b>Students should have knowledge of and be able to demonstrate proficiency in the following:</b>	
Adding, subtracting, multiplying, and dividing decimal numbers including negative numbers	Chapters 6, 7, 51
Adding, subtracting, multiplying, and dividing decimal numbers including negative numbers	Chapters 6, 7, 51
Adding, subtracting, multiplying, and dividing fractions	Chapters 6, 51
Adding, subtracting, multiplying, and dividing whole numbers including negative numbers	Chapters 6, 7, 51
Calculating $\Delta T$	Chapters 17, 51, 52

**Correlation of *Modern Refrigeration and Air Conditioning, 22e* to  
HVAC Excellence Competencies Task List: General Studies—page 2**

Competency/Task	Textbook Chapter(s)
Calculating squares, cubes, and roots for area and volume	Chapters 32, 51
Converting English measurements to Metric measurements and Metric to English	Chapters 6, 7, Appendices
Converting fractions to decimals, and decimals to fractions	Appendices
Measuring length, area, and volume using both inch pound (English) and SI (metric) measurements	Chapter 51
Solving basic equations	Chapters 5, 6, 7, 13, 14, 16, 32, 51
Manipulating ratios and proportions as they relate to various equipment and components, such as compressors, pumps, drive systems, and fans	Chapters 13, 14, 16, 17, 19, 22, 43, 47
<b>HVACR General Studies</b>	
<b>Students should have knowledge of and be able to demonstrate proficiency in:</b>	
HVACR industry organizations	Chapter 1, Appendices
Energy resources	Chapters 14, 33, 34, 39, 40
Energy efficiency ratings	Chapters 33, 36, 37, 40
Defining and differentiating between renewable and sustainable energy	Chapter 40
Life cycle cost analysis	Chapter 23
The meaning of the following acronyms: BIM, CBECS, ECM, EIA, EER, SEER, SEER2, AFUE, HSPF, USGBC, GBI, LEED, COP, ECM, DOE	Chapters 16, 19, 32, 36, 37, 40, 49
Energy auditing	Chapters 1, 31, 40
The thermodynamics of air and water vapor	Chapters 6, 7, 23, 24, 28, 32, 51, Appendices
The water vapor cycle in the earth's atmosphere	Chapters 24, 28, 29
Standard air volume and density	Chapter 28
Psychrometrics	Chapters 24, 28
The properties of each line on a psychrometric chart	Chapter 28
Plotting any two basic points on the psychrometric chart and evaluating the data	Chapter 28
Describing the eight processes of air conditioning and how to plot each on a psychrometric chart	Chapter 28
Explaining the comfort zone and the different temperatures and relative humidity's effect on human comfort	Chapter 28

**Correlation of *Modern Refrigeration and Air Conditioning, 22e* to  
HVAC Excellence Competencies Task List: General Studies—page 3**

<b>Competency/Task</b>	<b>Textbook Chapter(s)</b>
Explaining sensible heat ratio	Chapter 28
Calculating mixed air problems for infiltration and ventilation	Chapters 28, 29, 30
Calculating residential structure heat loss and gain	Chapters 30, 32, Appendices
Calculating duct sizing, using duct sizing formulas	Chapter 30
Developing critical-thinking skills including analysis, evaluation, calculations, and the use of computer technology	Chapters 6, 7, 18, 23, 25, 26, 32, 33, 34, 35, 40, 51, 52