



CERTIFIED SUBJECT MATTER EDUCATOR EXAM STUDY RESOURCE LIST

The following list of publications and resources can be used to prepare for the HVAC Excellence Certified Subject Matter Educator (CSME) examinations. Upon successful completion of the required series of examinations, an educator/trainer will have the title of Certified Master HVACR Educator (CMHE) bestowed upon them. For more information visit www.escogroup.org.

CSME: AIR CONDITIONING

Topics: Air conditioning theory, equipment service, systems and components, troubleshooting, metering devices, and applications

Number of Questions: 100

Recommended preparation and training resources:

- Electricity Theory and Application for HVACR (ESCO, most recent edition)
- HVACR Troubleshooting Fundamentals (ESCO, most recent edition)
- Refrigeration and Air Conditioning Technology (Cengage, most recent edition):
Units 1, 2, 3, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 31, 34, 35, 36, 37, 38, 40, 41
- Introduction to HVAC Systems (ASHRAE Learning Center, ESCO, hvacr.elearn.network)
- HVACR Troubleshooting Series (ESCO, hvacr.elearn.network)
- Modern Refrigeration and Air Conditioning (Goodheart-Willcox, most recent edition):
Chapters 4, 5, 8, 9, 10, 11, 19, 20, 21, 22, 23
- Air Conditioning Fundamentals (ESCO, hvacr.elearn.network)
- Fundamentals of HVACR (Pearson): Sections 3, 4, 5, 6, 7, 9, 12
- Airflow Characteristics and Diagnostics Course and Simulation (ESCO, hvacr.elearn.network)
- Air-flow Diagnostics from Soup to Nuts! (ESCO, hvacr.elearn.network)
- Calculating Friction Rate Webinar Replay (ESCO, hvacr.elearn.network)
- Air Conditioning Troubleshooting and Airflow Tips (ESCO, hvacr.elearn.network)
- Electricity for Refrigeration, Heating and Air Conditioning (Cengage, most recent edition)
- HVACRedu.net Air Conditioning course selections: 101, 103, 104, 111, 112, 113, 114, 121, 123, 138, 141, 142, 143, 186, 201, 204, 238, 239, 242, 243 (www.HVACRedu.net)

CSME: ELECTRICAL

Topics: Safety, theory, components, meter usage, fundamentals of motors and capacitors, interpreting electrical diagrams, and troubleshooting

Number of Questions: 100

Recommended preparation and training resources:

- Electricity Theory and Application for HVACR (ESCO, most recent edition)
- HVACR Troubleshooting Fundamentals (ESCO, most recent edition)
- Refrigeration and Air Conditioning Technology (Cengage, most recent edition):
Units 12, 13, 14, 15, 16, 17, 18, 19, 20
- HVACR Troubleshooting Series (ESCO, hvacr.elearn.network)
- Modern Refrigeration and Air Conditioning (Goodheart-Willcox, most recent edition):
Chapters 12, 13, 14, 15, 16, 17, 18



CERTIFIED SUBJECT MATTER EDUCATOR EXAM STUDY RESOURCE LIST

CSME: ELECTRICAL—CONTINUED

Topics: safety, theory, components, meter usage, fundamentals of motors and capacitors, interpreting electrical diagrams, and troubleshooting

Recommended preparation and training resources (continued):

- Fundamentals of HVACR (Pearson): Sections 5, 6, 7
- Electricity for Refrigeration, Heating and Air Conditioning (Cengage, most recent edition)
- HVACRedu.net Air Conditioning course selections: 111, 112, 113, 114 (www.HVACRedu.net)

CSME: ELECTRIC HEAT

Topics: Electric heating theory, power/Btuh conversions, system components, equipment installation, service, airflow, application, troubleshooting, and safety

Number of Questions: 100

Recommended preparation and training resources:

- Electricity Theory and Application for HVACR (ESCO, most recent edition)
- HVACR Troubleshooting Fundamentals (ESCO, most recent edition)
- Refrigeration and Air Conditioning Technology (Cengage, most recent edition): Units 30, 35, 37
- HVACR Troubleshooting Series (ESCO, hvacr.elearn.network)
- Modern Refrigeration and Air Conditioning (Goodheart-Willcox, most recent edition): Chapters 13, 16, 18, 30, 38
- Troubleshooting and Servicing Electric Furnaces Video (ESCO, hvacr.elearn.network)
- Fundamentals of HVACR (Pearson): Sections 5, 6, 7, 9
- Airflow Characteristics and Diagnostics Course and Simulation (ESCO, hvacr.elearn.network)
- Air-flow Diagnostics from Soup to Nuts! (ESCO, hvacr.elearn.network)
- Calculating Friction Rate Webinar Replay (ESCO, hvacr.elearn.network)
- Air Conditioning Troubleshooting and Airflow Tips (ESCO, hvacr.elearn.network)
- Electricity for Refrigeration, Heating and Air Conditioning (Cengage, most recent edition)
- HVACRedu.net Air Conditioning course selections: 111, 112, 113, 114, 139 (www.HVACRedu.net)

CSME: GAS HEAT

Topics: Heating safety, combustion theory, heating system components, troubleshooting, furnace installation, service, and troubleshooting

Number of Questions: 100

Recommended preparation and training resources:

- Electricity Theory and Application for HVACR (ESCO, most recent edition)
- Gas Heating (ESCO, most recent edition)
- Gas Heating: Furnaces, Boilers, Components, and Controls Training Course (ESCO, hvacr.elearn.network)



CERTIFIED SUBJECT MATTER EDUCATOR EXAM STUDY RESOURCE LIST

CSME: GAS HEAT—CONTINUED

Topics: Heating safety, combustion theory, heating system components, troubleshooting, furnace installation, service, and troubleshooting

Recommended preparation and training resources (continued):

- HVACR Troubleshooting Fundamentals (ESCO, most recent edition)
- Refrigeration and Air Conditioning Technology (Cengage, most recent edition): Units 12, 13, 14, 15, 16, 17, 18, 19, 20, 31, 34, 37, 38
- Gas Heating Spark Ignition Systems Training Course (ESCO, hvacr.elearn.network)
- Gas Heating Systems (Spark Ignition) Training Simulator (ESCO, hvacr.elearn.network)
- Combustion Analysis and Fuel Efficiency (ESCO, most recent edition)
- Carbon Monoxide: A Clear and Present Danger (ESCO, most recent edition)
- HVACR Troubleshooting Series (ESCO, hvacr.elearn.network)
- Modern Refrigeration and Air Conditioning (Goodheart-Willcox, most recent edition): Chapters 12, 13, 14, 15, 16, 17, 18, 41
- Fundamentals of HVACR (Pearson): Sections 5, 6, 7, 9
- Airflow Characteristics and Diagnostics Course and Simulation (ESCO, hvacr.elearn.network)
- Air-flow Diagnostics from Soup to Nuts! (ESCO, hvacr.elearn.network)
- Calculating Friction Rate Webinar Replay (ESCO, hvacr.elearn.network)
- Air Conditioning Troubleshooting and Airflow Tips (ESCO, hvacr.elearn.network)
- Electricity for Refrigeration, Heating and Air Conditioning (Cengage, most recent edition)
- HVACRedu.net Air Conditioning course selections: 111, 112, 113, 114, 133, 243 (www.HVACRedu.net)

CSME: HEAT PUMPS

Topics: components, controls, theory of the heat pump cycle, service, troubleshooting, and interpreting heat pump schematics

Number of Questions: 100

Recommended preparation and training resources:

- Heat Pumps (ESCO, most recent edition)
- Heat Pumps (Cengage, most recent edition)
- Electricity Theory and Application for HVACR (ESCO, most recent edition)
- HVACR Troubleshooting Fundamentals (ESCO, most recent edition)
- Refrigeration and Air Conditioning Technology (Cengage, most recent edition): Units 12, 13, 14, 15, 16, 17, 18, 19, 20, 31, 34, 37, 38, 43, 44
- Uncomplicating the Heat Pump: Electrical Systems Troubleshooting Video (ESCO, hvacr.elearn.network)
- HVACR Troubleshooting Series (ESCO, hvacr.elearn.network)
- Modern Refrigeration and Air Conditioning (Goodheart-Willcox, most recent edition): Chapters 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 27, 41
- Heat Pump System Diagnostics (ESCO, hvacr.elearn.network)
- Fundamentals of HVACR (Pearson): Sections 3, 4, 5, 6, 7, 8, 9, 12



CERTIFIED SUBJECT MATTER EDUCATOR EXAM STUDY RESOURCE LIST

CSME: HEAT PUMPS—CONTINUED

Topics: components, controls, theory of the heat pump cycle, service, troubleshooting, and interpreting heat pump schematics

Recommended preparation and training resources (continued):

- Airflow Characteristics and Diagnostics Course and Simulation (ESCO, hvacr.elearn.network)
- Air-flow Diagnostics from Soup to Nuts! (ESCO, hvacr.elearn.network)
- Calculating Friction Rate Webinar Replay (ESCO, hvacr.elearn.network)
- Air Conditioning Troubleshooting and Airflow Tips (ESCO, hvacr.elearn.network)
- Electricity for Refrigeration, Heating and Air Conditioning (Cengage, most recent edition)
- HVACRedu.net Air Conditioning course selections: 101, 103, 104, 111, 112, 113, 114, 121, 123, 135, 137, 138, 238, 141, 142, 143, 242, 243 (www.HVACRedu.net)

CSME: LIGHT COMMERCIAL AIR CONDITIONING

Topics: Commercial AC systems, components, equipment installation, service, refrigeration theory, application, and troubleshooting

Number of Questions: 100

Recommended preparation and training resources:

- Electricity Theory and Application for HVACR (ESCO, most recent edition)
- HVACR Troubleshooting Fundamentals (ESCO, most recent edition)
- Refrigeration and Air Conditioning Technology (Cengage, most recent edition): Units 1, 2, 3, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 31, 34, 35, 36, 37, 38, 40, 41
- HVACR Troubleshooting Series (ESCO, hvacr.elearn.network)
- Modern Refrigeration and Air Conditioning (Goodheart-Willcox, most recent edition): Chapters 6, 8, 9, 10, 11, 21, 22, 23, 27, 32, 33, 51, 52
- Fundamentals of HVACR (Pearson): Sections 3, 4, 5, 6, 7, 9, 12
- Airflow Characteristics and Diagnostics Course and Simulation (ESCO, hvacr.elearn.network)
- Air-flow Diagnostics from Soup to Nuts! (ESCO, hvacr.elearn.network)
- Calculating Friction Rate Webinar Replay (ESCO, hvacr.elearn.network)
- Air Conditioning Troubleshooting and Airflow Tips (ESCO, hvacr.elearn.network)
- Electricity for Refrigeration, Heating and Air Conditioning (Cengage, most recent edition)
- HVACRedu.net Air Conditioning course selections: 101, 103, 104, 111, 112, 113, 114, 121, 123, 138, 141, 142, 143, 186, 201, 202, 203, 204, 238, 239, 241, 242, 243, 402, 403 (www.HVACRedu.net)



CERTIFIED SUBJECT MATTER EDUCATOR EXAM STUDY RESOURCE LIST

CSME: LIGHT COMMERCIAL REFRIGERATION

Topics: Equipment installation, service, refrigeration systems, components, refrigeration theory, application, and troubleshooting

Number of Questions: 100

Recommended preparation and training resources:

- Electricity Theory and Application for HVACR (ESCO, most recent edition)
- HVACR Troubleshooting Fundamentals (ESCO, most recent edition)
- Refrigeration and Air Conditioning Technology (Cengage, most recent edition):
Units 1, 2, 3, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29
- HVACR Troubleshooting Series (ESCO, hvacr.elearn.network)
- Modern Refrigeration and Air Conditioning (Goodheart-Willcox, most recent edition):
Chapters 6, 9, 10, 11, 16, 18, 22, 23, 26
- Fundamentals of HVACR (Pearson): Sections 3, 4, 5, 6, 7, 12
- Commercial Refrigeration (Cengage, most recent edition)
- Electricity for Refrigeration, Heating and Air Conditioning (Cengage, most recent edition)
- HVACRedu.net Air Conditioning course selections: 101, 104, 111, 112, 113, 114, 138, 141, 142, 143, 186, 201, 202, 203, 204, 238, 239, 241, 242, 243, 402, 403, 441, 442, 444 (www.HVACRedu.net)

CSME: OIL HEAT

Topics: Combustion theory, oil heating system components, troubleshooting, furnace installation, service, troubleshooting, and heating safety

Number of Questions: 100

Recommended preparation and training resources:

- Electricity Theory and Application for HVACR (ESCO, most recent edition)
- Liquid Heating Fuels Technicians Manual (NORA, most recent edition)
- HVACR Troubleshooting Fundamentals (ESCO, most recent edition)
- Refrigeration and Air Conditioning Technology (Cengage, most recent edition):
Units 1, 2, 3, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 31, 32, 34, 35, 36, 37, 38, 40, 41
- Combustion Analysis and Fuel Efficiency (ESCO, most recent edition)
- Carbon Monoxide: A Clear and Present Danger (ESCO, most recent edition)
- HVACR Troubleshooting Series (ESCO, hvacr.elearn.network)
- Modern Refrigeration and Air Conditioning (Goodheart-Willcox, most recent edition):
Chapters 12, 13, 14, 15, 16, 17, 18, 42
- Fundamentals of HVACR (Pearson): Sections 5, 6, 7, 9
- Airflow Characteristics and Diagnostics Course and Simulation (ESCO, hvacr.elearn.network)
- Air-flow Diagnostics from Soup to Nuts! (ESCO, hvacr.elearn.network)
- Calculating Friction Rate Webinar Replay (ESCO, hvacr.elearn.network)
- Air Conditioning Troubleshooting and Airflow Tips (ESCO, hvacr.elearn.network)
- Electricity for Refrigeration, Heating and Air Conditioning (Cengage, most recent edition)
- HVACRedu.net Air Conditioning course selections: 111, 112, 113, 114, 131, 239, 243 (www.HVACRedu.net)



CERTIFIED SUBJECT MATTER EDUCATOR EXAM STUDY RESOURCE LIST

CSME: TEACHING METHODOLOGIES, PRINCIPLES, AND PRACTICES

Topics: Education terms, teaching methodologies, learning styles, principles, classroom environment and management, classroom situations and action items

Number of Questions: Capstone, 50 questions

Recommended preparation and training resources:

- “Becoming an Effective Trainer” online training program (ESCO, escogroup.org)
- National Center for Innovation in Career and Technical Education (ctereseachnetwork.org)
- CTE Resource Center (ctereseach.org)
- CTE Learn (ctelearn.org)
- Association for Supervision and Curriculum Development (www.ascd.org)
- American Society for Talent Development (www.td.org)
- American Psychological Association (www.apa.org)
- Education Research Information Center (www.eric.ed.gov)
- Gale Research (www.gale.com)
- Participate or assist in administrative roles like, but not limited, to the following:
 - Accreditation
 - Advisory Committees
 - Applying and obtaining grants
 - Student services & Student assistance programs
 - Team teaching or Observe others teaching
 - A brief understanding of Title 5 Education Codes (This is a big and boring text but focus on what student information can and cannot be shared, student access or student support, and how interaction with students must be professional). Think of the Ed Code, or at least the areas of focus, as an example of ethics, and inclusion.