

L1 SHEET METAL

LEVEL 1



Curriculum Notes



- 192.5 Hours (includes Core)
- Updated: 2019
- NATE-Recognized Training Provider
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.

PAPERBACK

ISBN

Trainee Guide: \$69.99

978-0-13-662951-1

MODULES

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

Occupational Overview: The Sheet Metal Industry (7.5 Hours)

ISBN 978-0-13-662995-5

(Module ID 04101) Summarizes the history and development of the sheet metal craft. Explains the benefits of apprenticeship training, and identifies career opportunities in the trade.

NATE CERTIFICATION

NCCER is an officially recognized training provider for North American Technician Excellence (NATE), an independent, third-party certification body for HVAC/R technicians. NATE-certified technicians can use module completions through NCCER-accredited training providers for the continuing education hours required for recertification through NATE. For details and lists of available NATE-recognized training, visit www.natex.org. For more information regarding NATE recertification, please contact NCCER Customer Service at 1-888-622-3720.

Sheet Metal Tools and Equipment (10 Hours)

ISBN 978-0-13-662993-1

(Module ID 04102) Describes the hand and power tools used in the sheet metal craft, including layout tools and cutting, bending, and forming machines. Includes safety and maintenance guidelines.

Plasma Arc Cutting (7.5 Hours)

ISBN 978-0-13-418269-8

(Module ID 29103) Introduces plasma arc cutting equipment and safe work area preparation. Identifies correct amperage, gas pressures, and flow rates. Covers plasma-arc cutting methods for piercing, slotting, squaring, and beveling metals. Explains how to store equipment and clean the work area.

Sheet Metal Math and Measurements (20 Hours)

ISBN 978-0-13-662952-8

(Module ID 04104) Covers calculations using denominate numbers, area and volume calculations, English-metric system conversions, basic geometry, percentages, and calculation of stretchouts.

Sheet Metal Layout and Processes (17.5 Hours)

ISBN 978-0-13-663008-1

(Module ID 04103) Introduces parallel line development, radial line development, and triangulation. Covers the selection and use of layout, hand, and machine tools. Discusses how to transfer patterns, and how to cut, form, and assemble parts.

Parallel Line Development (27.5 Hours)

ISBN 978-0-13-663005-0

(Module ID 04105) Covers the steps involved in using the parallel line development method to lay out fittings. Includes step-by-step procedures for selected fittings.

Installation of Ductwork (15 Hours)

ISBN 978-0-13-662972-6

(Module ID 04106) Addresses ductwork assembly, use of different types of sealants, using lifts, and installation of ductwork. Describes the types of fasteners (screws, nuts, bolts, and rivets), and supports used in an air distribution system. Discusses proper spacing of hangers, load ratings, and installation of hangers and support systems.

Installation of Air Distribution Accessories (12.5 Hours)

ISBN 978-0-13-662996-2

(Module ID 04107) Describes how air distribution accessories such as louvers, dampers, and access doors function as part of an air distribution system. Includes installation guidelines and checklists.

L2 SHEET METAL

LEVEL 2

Curriculum Notes

- 147.5 Hours
- Updated: 2019
- NATE-Recognized Training Provider
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.



PAPERBACK

ISBN

Trainee Guide: \$99.99

978-0-13-663023-4

MODULES

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

Field Measurements, Calculations, and Fittings (25 Hours)

ISBN 978-0-13-663044-9

(Module ID 04301) Describes the techniques used for field measuring and layout of ductruns and fittings. Covers the math involved in creating various offsets and seam allowances, based on field measurements to fit unique and specific situations.

Construction and Sheet Metal Drawings (17.5 Hours)

ISBN 978-0-13-663047-0

(Module ID 04202) Reviews how to read and interpret section, elevation, and detail drawings. Also covers the drawings used by a variety of crafts. Includes practice using drawings with a large drawing package.

Radial Line Development (20 Hours)

ISBN 978-0-13-663043-2

(Module ID 04203) Introduces radial line development principles used to determine layouts for sheet metal fittings. Includes practice layout and fabrication tasks that allow trainees to develop and demonstrate their skills.

Triangulation (40 Hours)

ISBN 978-0-13-663038-8

(Module ID 04306) Describes the principles of triangulation and how it can be used to measure ductrun fittings. Provides a variety of tasks to practice developing, laying out, and fabricating selected ductrun fittings.

Sheet Metal Duct Fabrication Standards (7.5 Hours)

ISBN 978-0-13-663046-3

(Module ID 04204) Explains how to determine the requirements for a duct system, including operating pressures, metal gauges, connectors, reinforcements, tie rods, and seams. Also reviews how to use standards, codes, and ordinances to design a duct system.

Bend Allowances (7.5 Hours)

ISBN 978-0-13-663039-5

(Module ID 04206) Provides instruction and practice in determining proper bend allowances in sheet metal. Also reviews the interplay of different factors that affect the amount of bend allowance needed and the methods for calculating allowance.

Soldering (15 Hours)

ISBN 978-0-13-663053-1

(Module ID 04207) Identifies soldering tools, materials, and techniques. Also provides a wide range of soldering tasks for practice.

Air Distribution Systems (15 Hours)

ISBN 978-0-13-340345-9

(Module ID 03109) Describes the factors related to air movement and its measurement in common air distribution systems. Presents the required mechanical equipment and materials used to create air distribution systems. Introduces basic system design principles for both hot and cold climates.

Continued on following page

L3 SHEET METAL	
LEVEL 3	
Curriculum Notes	
<ul style="list-style-type: none"> • 145 Hours • Updated: 2019 • NATE-Recognized Training Provider • Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc. 	
PAPERBACK	ISBN
Trainee Guide: \$99.99	978-0-13-663060-9

MODULES

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

Commercial Airside Systems (12.5 Hours)

ISBN 978-0-13-546046-7

(Module ID 03201) Describes the systems, equipment, and operating sequences commercial airside system configurations such as constant volume single-zone and multi-zone, VVT, VAV, and dual-duct VAV.



Principles of Airflow (25 Hours)

ISBN 978-0-13-663106-4

(Module ID 04303) Explains the basic principles of airflow and reviews how airflow is affected by duct size, shape, and fittings. Also reviews the components of an air distribution system.

Using Construction Drawings in Sheet Metal (30 Hours)

(30 Hours)

ISBN 978-0-13-663101-9

(Module ID 04308) Covers equipment schedules, material takeoffs, and craft scheduling. Explains how to put knowledge of construction drawings and documents to work as a sheet metal fabricator or installer.

Sheet Metal Job Specifications (20 Hours)

ISBN 978-0-13-663098-2

(Module ID 04305) Explains how to balance an air distribution system so that the right amount of air is correctly distributed at the proper velocities and returned to the heating and cooling units. Reviews the tools and techniques used for adjusting fans, volume dampers, registers, and grilles. Provides proper techniques for duct leakage testing.

Air Testing and Balancing (30 Hours)

ISBN 978-0-13-663091-3

(Module ID 04402) Describes the use of project specifications and submittals. Covers how specifications and submittals are applied when working on a specific job. Covers the coordination of crafts.

Blanket Insulation for Ducts (7.5 Hours)

ISBN 978-0-13-498777-4

(Module ID 19202) Covers fiberglass blanket installation to ducts and apparatus and discusses vapor-sealed blanket insulation facings.

Board Insulation For Ducts (20 Hours)

ISBN 978-0-13-498775-0

(Module ID 19203) Covers fiberglass board insulation applications, such as cutting fiberglass board insulation to fit over standing seams and stiffeners, vapor-seal applications, and cutting and installing fiberglass board insulation on round or oval ducts.

L4 SHEET METAL	
LEVEL 4	
Curriculum Notes	
<ul style="list-style-type: none"> • 147.5 Hours • Updated: 2019 • NATE-Recognized Training Provider • Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc. 	
PAPERBACK	ISBN
Trainee Guide: \$99.99	978-0-13-663222-1

MODULES

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

Fume and Exhaust System Design (25 Hours)

ISBN 978-0-13-663208-5

(Module ID 04404) Reviews the codes and specifications pertaining to fume and exhaust system design for safe workspaces. Provides instruction in selecting the appropriate materials for fume or exhaust system components and to identify the different types of hoods and applications for each.



Welding and Brazing (25 Hours)

ISBN 978-0-13-663221-4

(Module ID 04403) Introduces the techniques and proper operation of equipment used for welding and brazing. Emphasizes safety and awareness of hazards involved. Trainees practice welds in a variety of positions and perform a basic braze.

Oxyfuel Cutting (17.5 Hours)

ISBN 978-0-13-418268-1

(Module ID 29102) Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and setup requirements. Explains how to light, adjust, and shut down oxyfuel equipment. Trainees will perform cutting techniques that include straight line, piercing, bevels, washing, and gouging.

Architectural Sheet Metal (25 Hours)

ISBN 978-0-13-663213-9

(Module ID 04307) Teaches how to lay out and fabricate sheet metal components of a roof drainage system, including flashing, gutters, and downspouts.

Shop Production and Organization (25 Hours)

ISBN 978-0-13-663207-8

(Module ID 04401) Introduces the production, organization, planning, and control functions that occur in a sheet metal shop. Emphasizes optimization of processes and accurate estimating for competitive bidding. Discusses project planning techniques, principles of efficient shop layout and materials flow, as well as the roles and relationships of shop personnel.

Sheet Metal Business and Technology (7.5 Hours)

ISBN 978-0-13-663226-9

(Module ID 04407) Covers advancements in software and technology as it pertains to sheet metal workflow. Covers tools to enhance design, estimation, fabrication, installation, and project documentation.

Fundamentals of Crew Leadership (22.5 Hours)

ISBN 978-0-13-487188-2

(Module ID 46101) Covers basic leadership skills and explains different leadership styles, communication, delegating, and problem solving. Jobsite safety and the crew leader's role in safety are discussed, as well as project planning, scheduling, and estimating. Includes performance tasks to assist the learning process.

