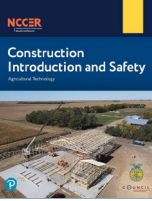


Agricultural Technology

CONSTRUCTION INTRODUCTION AND SAFETY



Curriculum Notes

- 107.5 Hours
- Released 2025
- Downloadable instructor resources are available.

PAPERBACK

Trainee Guide: \$74.99

ISBN

978-0-13-544448-1

MODULES

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

Build Your Future in Construction (2.5 Hours)

ISBN 978-0-13-544465-8

(Module ID 93101) Construction is an exciting career with an abundance of opportunities for carpenters, pipefitters, welders, electricians, and heavy equipment operators. This module introduces the state of the construction industry, training options, and career opportunities available to apply these skills within the agricultural industry and the broader community.

Basic Safety (12.5 Hours)

ISBN 978-0-13-544460-3

(Module ID 93102) Work at agricultural, construction, and industrial jobsites is hazardous. This module reviews the prevention of at-risk behavior through effective planning and safety training. It demonstrates how to establish a proactive safety program so that safety is every worker's responsibility.

Introduction to Construction Math (10 Hours)

ISBN 978-0-13-544463-4

(Module ID 93103) Craft professionals rely on math to do their jobs accurately and efficiently. The knowledge of basic math and geometry is needed in construction, mining, and agricultural industries. This module reviews the math skills that you will use for whichever craft lies in your future.

Introduction to Hand Tools (12.5 Hours)

ISBN 978-0-13-544464-1

(Module ID 93104) The construction crafts require a broad array of hand tools. A true craft professional invests wisely in hand tools, and uses, maintains, and stores them with the same wisdom. Even if you are familiar with some of the tools, this module introduces many of the tools used in the construction crafts and how to use them safely.

Introduction to Power Tools (10 Hours)

ISBN 978-0-13-544449-8

(Module ID 93105) Power tools play an important role in the agricultural construction industry. Regardless of their specialization, all construction workers eventually use power tools on their job. This module provides an overview of the common types of power tools and how they function. It also describes the proper techniques required to ensure their safe and efficient operation.

Introduction to Construction Drawings (10 Hours)

ISBN 978-0-13-544450-4

(Module ID 93106) Various types of construction drawings are used to represent parts of building and agricultural projects. They provide information about contours, structures, and the layout of the buildings. This module introduces common types of construction drawings, their basic components, standard drawing elements, and measurement tools used in the construction industry.

Introduction to Basic Rigging (7.5 Hours)

ISBN 978-0-13-544454-2

(Module ID 93107) Movement of material and equipment is common at every agricultural and construction site. The movement of material from one place to another using various types of lifting gear is called rigging. This module provides an overview of the various types of rigging equipment, common hitches used during a rigging operation, and the related Emergency Stop hand signal.

Basic Communication Skills (7.5 Hours)

ISBN 978-0-13-544455-9

(Module ID 93108) Communicating skillfully will help you become a better worker and a more effective leader in construction or agriculture. This module teaches active listening and speaking skills. It explains how to use written materials and provides techniques that will help you improve your writing skills for emails, business documents, and onsite communication.

Basic Employability Skills (7.5 Hours)

ISBN 978-0-13-544456-6

(Module ID 93109) Becoming gainfully employed in the construction and agricultural industries takes more preparation than simply filling out a job application. Understanding how these industries and potential employers operate is essential to finding ways to bring value to an organization in need of your specific skills. This module discusses the skills needed to pursue employment successfully.

Introduction to Material Handling (5 Hours)

ISBN 978-0-13-544457-3

(Module ID 93110) Lifting, stacking, transporting, and unloading materials such as bricks, feed, crates, and various supplies are routine tasks on a jobsite. Whether performing these tasks manually or with specialized equipment, workers must follow basic safety guidelines to keep themselves and their co-workers safe. This module provides guidelines for using the appropriate PPE for the material being handled and using proper techniques to carry out the job.

Introduction to Leadership (22.5 Hours)

ISBN 978-0-13-544459-7

(Module ID 93111) As a frontline leader on a farm or construction site, you must communicate effectively, providing direction to your crew and ensuring the jobsite is safe for everyone. Whether you are already a frontline leader or want to become one, this module will help you learn more about the requirements and skills needed to succeed.

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HEAVY EQUIPMENT OPERATIONS AND SAFETY



Curriculum Notes

- 152.5 Hours
- Released: 2025
- Downloadable instructor resources are available.

PAPERBACK

Trainee Guide: \$74.99

ISBN

978-0-13-545798-6

MODULES

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

Introduction to Heavy Equipment (5 Hours)

ISBN 978-0-13-546905-7

(Module ID 93201) This module provides an overview of heavy equipment used in construction, agricultural operations, and mining work. It explains the structure of an apprentice training program for heavy equipment operation and outlines the values that help a person succeed as an operator. The module also introduces safety issues associated with heavy equipment operations.

Heavy Equipment Operations Safety (15 Hours)

ISBN 978-0-13-546909-5

(Module ID 93202) The heavy equipment operator's job is to handle construction and earth moving equipment in a manner that protects both the operator and other workers on the jobsite or farm. This module covers the dangers associated with working around heavy equipment and highlights the rules and practices that protect workers and equipment, keeping the jobsite safe.

Classification of Heavy Equipment (10 Hours)

ISBN 978-0-13-546915-6

(Module ID 93203) There are many different types of heavy equipment, some designed specifically for agricultural work and others for general construction. Many machines can be modified with attachments to perform a variety of functions. This module covers the capabilities and limitations of heavy equipment, various attachments, and how to use them properly.

Utility Tractors (17.5 Hours)

ISBN 978-0-13-546916-3

(Module ID 93204) In addition to the larger, heavier types of construction equipment, there is a smaller category of machines called utility tractors. These machines can effectively handle lighter construction and agricultural tasks that would be a waste of heavier equipment's capabilities. This module explores the operations, capabilities and safe handling of utility tractors.

Backhoes (30 Hours)

ISBN 978-0-13-546919-4

(Module ID 93205) One of the most popular and versatile pieces of equipment on a construction or agricultural jobsite is the rubber-tire tractor-mounted backhoe. This module describes the startup, operation, and attachments of backhoes. It also explores the responsibilities of craft professionals, farm hands, and ranch hands to safely use and maintain this essential piece of equipment.

Skid Steers (22.5 Hours)

ISBN 978-0-13-546921-7

(Module ID 93206) Skid steers are compact, highly maneuverable machines designed to accept various attachments to accomplish a wide array of tasks. This module explores the basic care and proper operation of skid steer machines and some of the many attachments that make them an indispensable tool in construction and agriculture.

Introduction to Earthmoving (12.5 Hours)

ISBN 978-0-13-546924-8

(Module ID 93207) One of the main purposes of heavy equipment is to move earth to excavate, fill, and shape the land's surface. This module provides a broad introduction to the various aspects of earthmoving operations and equipment used on construction and agricultural jobsites. Topics include planning and safety measures, worksite practices, soil properties, and stabilization.

Grades and Grading (15 Hours)

ISBN 978-0-13-546926-2

(Module ID 93208) Heavy equipment operators are often involved in moving earth to level the ground in preparation for planned construction or agricultural land use. In this module, you will receive an introduction to the surveying and civil engineering methods involved in marking and grading slopes to change the lay of the land's surface as part of a construction or agricultural project.

Introduction to GPS/GNSS (5 Hours)

ISBN 978-0-13-546928-6

(Module ID 93209) Global Positioning System (GPS) and Global Navigation Satellite System (GNSS) are used extensively with earthmoving equipment for construction and agricultural projects. This module explains how GPS/GNSS systems are used on earthmoving equipment to follow ground-contouring plans, monitor the health of equipment, and provide data from surrounding land and objects.

Equipment Operation, Inspection, and Readiness

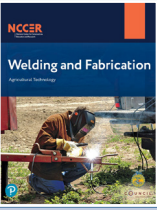
(25 Hours)

ISBN 978-0-13-546929-3

(Module ID 93210) Before operating any construction or agricultural machines, it is important to conduct an inspection to ensure the heavy equipment is in operational condition. This module covers information about prestart checks and some of the hazards and dangers that can occur when a piece of heavy equipment is not checked or inspected prior to operating on a jobsite.

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WELDING AND FABRICATION



Curriculum Notes

- 125 Hours
- Released: 2025
- Downloadable instructor resources are available.

PAPERBACK	ISBN
Trainee Guide: \$74.99	978-0-13-545768-9

MODULES

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

Welding Safety (5 Hours)

ISBN 978-0-13-546963-7

(Module ID 93301) Today's industrial and technological world needs qualified welders in heavy industry, construction, and agricultural operations. Succeeding in welding requires not just skill but a commitment to working safely. This module introduces the safety equipment, protective clothing, and procedures applicable to the cutting and welding of metals.

Welding Basics (22.5 Hours)

ISBN 978-0-13-546964-4

(Module ID 93302) Producing high quality welds requires a understanding of the materials and equipment being used during the welding process. This module introduces the agricultural trainee to the equipment, methods, and safety practices of welding and cutting of metals. It also illustrates proper weld and joint design for repairing and constructing strong, durable equipment needed to run daily operations on a farm or ranch.

Welding Symbols (5 Hours)

ISBN 978-0-13-546964-4

(Module ID 93303) Project drawings and specifications contain many symbols that communicate critical information about the welds to be used in a project. Welders must learn this symbolic language so they can make welds that meet design specifications. This module identifies a wide range of welding symbols and explains the basic rules for applying the information that the symbols convey.

Reading Welding Detail Drawings (10 Hours)

ISBN 978-0-13-546964-4

(Module ID 93304) Reading and interpreting the information contained in construction drawings is an essential skill for welders. This module focuses on how to read and interpret assembly and detail drawings. It introduces the basic drawing elements used in welding detail drawings and explains how to interpret dimensional information, notes, and bills of materials.

Oxyfuel Cutting (17.5 Hours)

ISBN 978-0-13-546957-6

(Module ID 93305) Oxyfuel cutting, a versatile method, produces an extremely hot flame by burning fuel gas with pure oxygen. Since the method involves flammable gases and open flames, however, it's quite hazardous. This module introduces the method, equipment, procedures, and safety practices applicable to construction and agricultural metal cutting activities.

Plasma Arc Cutting (7.5 Hours)

ISBN 978-0-13-546959-0

(Module ID 93306) Welders cut metals using several different technologies, but few are as efficient as plasma arc cutting, which rapidly and precisely cuts metals with a superheated, electrically charged gas jet. This module reviews the method, equipment, procedures, and safety practices of this specialized welding process.

Air-Carbon Arc Cutting and Gouging (10 Hours)

ISBN 978-0-13-546943-9

(Module ID 93307) Air-carbon arc cutting (A-CAC) uses an electric current to melt metal and an air jet to blast it away. The result is a clean cut that's free from contamination. This module covers the method, equipment, procedures, and safety practices of A-CAC cutting, washing, and gouging activities.

Physical Characteristics and Mechanical Properties of Metals (7.5 Hours)

ISBN 978-0-13-546945-3

(Module ID 93308) Craft professionals, farm hands, and ranch hands engaging in welding tasks must be familiar with the physical characteristics and mechanical properties of base metals and filler metals. This module explains the properties, classification, and identification of common metals and alloys. It also identifies the various standard metal forms and structural shapes of base metals.

Base Metal Preparation (12.5 Hours)

ISBN 978-0-13-546949-1

(Module ID 93309) Before welders can join metals together, they must properly prepare them. This module describes how to clean and prepare all types of base metals for cutting and welding. It also explains standard weld joint designs and the codes that govern them.

SMAW – Equipment and Setup (5 Hours)

ISBN 978-0-13-546950-7

(Module ID 93310) The simplicity and versatility of shielded metal arc welding (SMAW) makes it the most popular welding process. It's suitable for many applications, including agricultural uses, and requires relatively basic equipment. This module describes the set up and use of SMAW equipment. It also explores SMAW safety and lays the groundwork for SMAW welding techniques.

SMAW Electrodes (2.5 Hours)

ISBN 978-0-13-546951-4

(Module ID 93311) Shielded metal arc welding (SMAW) uses an electric current to deliver electric current and melt the base metal. A weld is formed as the electrode mixes with the molten base metal. Since the electrode becomes part of the weld, its properties are extremely important. This module explores SMAW electrodes, their properties, and the system that classifies them.

GMAW and FCAW – Equipment and Filler Metals (10 Hours)

ISBN xxx-x-xx-xxxxxx-x

(Module ID 93312) Gas metal arc welding (GMAW) and flux-cored arc welding (FCAW) are two common welding processes. This module describes GMAW and FCAW processes and related basic safety practices. It also provides an overview of GMAW and FCAW equipment, setup, and types of filler metals used.

GMAW and FCAW – Equipment and Filler Metals (10 Hours)

ISBN 978-0-13-546954-5

(Module ID 93313) This module explains how to properly select filler metals, base metals, and shielding gases used in the gas tungsten arc welding (GTAW) process to produce consistent, high-quality welds. It also provides an overview of the equipment, its setup, and several safety concerns associated with GTAW and shielding gases.

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