Heavy Equipment Operations

MODULES

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

Orientation to the Trade (5 Hours)
(Module ID 22101-12) Provides an overview of heavy equipment terminology, operations, operator responsibilities, career opportunities, and basic principles of safety.

Heavy Equipment Safety (10 Hours)
ISBN 978-0-13-292306-4
(Module ID 22102-12) Covers prestart checks of a machine’s hardware (frame, body panels, tires or tracks, and safety equipment), driveline components, hydraulic system components, electrical components, and controls. Reviews machine safety issues. Explains how to safely start, move, steer, stop, and shut down different types of machines.

Utility Tractors (17.5 Hours)
(Module ID 22105-12) Covers operation of general utility tractors in the construction industry. Discusses duties and responsibilities of the operator, safety rules for operation, the attachment of implements, and basic preventive maintenance practices.

Introduction to Earthmoving (12.5 Hours)
(Module ID 22201-12) Provides a broad introduction to the process of planning and executing earthmoving activities on various types of construction projects. The use of heavy equipment such as bulldozers, scrapers, excavators, and loaders is explained.

Grades (15 Hours)
(Module ID 22206-12) Introduces the concept of preparing graded surfaces using heavy equipment. Covers identification of construction stakes and interpretation of marks on each type of stake. Describes the process for grading slopes.

On-Road Dump Trucks (20 Hours)
ISBN 978-0-13-340319-0
(Module ID 22202-13) Covers uses, inspection, startup, shutdown, operator maintenance, and operation of dump trucks used to carry loads on public highways. Includes operation of dump trucks in normal and emergency situations.

Excavation Math (17.5 Hours)
(Module ID 22207-13) Covers basic math skills required for site excavation work. Includes methods and practice in calculating the areas and volumes of various geometric shapes, as well as formulas and methods used to calculate cut and fill requirements on a job.

Interpreting Civil Drawings (20 Hours)
(Module ID 22209-13) Explains how to read site plans to calculate cut and fill requirements. Provides instruction and practice in interpreting both roadway and construction site drawings used for excavation and grading work.

Site Work (20 Hours)
(Module ID 22210-13) Expands on information covered in Level 1 in relation to setting and interpreting grade stakes. Also provides information and instructions on controlling surface water and ground water on a job site, as well as the layout of foundations and laying of pipe.

Soils (10 Hours)
(Module ID 22208-13) Describes soil classification systems and explains how shrink and swell factors affect equipment selection. Discusses how soil conditions affect equipment performance and explains techniques for working with various types of soils.

Skid Steers (22.5 Hours)
(Module ID 22212-13) Describes the many uses of skid steers and the attachments available for these machines. Covers safety practices, as well as inspection, startup, shutdown, and operation of skid steers.

Loaders (17.5 Hours)
(Module ID 22205-13) Covers the uses of wheel and track loaders, as well as operator maintenance, loader safety, and operating procedures. Includes procedures for using loaders in excavation, grading, and demolition work.

Scrapers (17.5 Hours)
(Module ID 22204-13) Describes the types of scrapers used in site preparation, as well as the safe practices associated with the operation of scrapers. Covers operator inspection and maintenance requirements, along with startup, shutdown, and operating techniques.

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Heavy Equipment Operations Level 3

**Curriculum Notes**
- 215 Hours
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.

**PAPERBACK**
- ISBN
- Individual Modules: $24.99 [see module list]

**DIGITAL**
- ISBN
- NCCERconnect +

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

**Finishing and Grading** (25 Hours)
  (Module ID 22307-14) Provides training on common types of equipment and instruments used for finish grading; materials and methods used to stabilize soils and control soil erosion; and finishing and grading methods used for various applications.

**Compaction Equipment** (25 Hours)
  (Module ID 22203-14) Provides training on common types of compaction equipment; the primary instruments, controls, and attachments of a roller; safety guidelines associated with compaction equipment; and prestart inspections, preventive maintenance, and proper operating procedures. Presents factors involved in work activities associated with a roller.

**Backhoes** (30 Hours)
  (Module ID 22303-14) Identifies and describes the common uses, types, components, instruments, controls, and attachments of backhoes. Presents safety guidelines, prestart inspection procedures, and preventive maintenance requirements. Describes basic startup and operation, and covers common work activities associated with backhoes.

**Off-Road Dump Trucks** (30 Hours)
  (Module ID 22310-14) Identifies and describes the common types, uses, and components of off-road dump trucks. Presents safety guidelines, prestart inspection procedures, and preventive maintenance requirements. Covers basic startup, driving maneuvers, loading, and dumping procedures for off-road dump trucks.

**Dozers** (30 Hours)
- ISBN 978-0-13-382759-0
  (Module ID 22302-14) Identifies and describes the common uses, types, and components of dozers. Presents safety guidelines, prestart inspection procedures, and preventive maintenance requirements. Describes basic startup and operation, and covers common work activities associated with dozers.

**Excavators** (35 Hours)
  (Module ID 22304-14) Identifies and describes the common types, uses, and components of excavators. Presents safety guidelines, prestart inspection procedures, and preventive maintenance requirements. Describes basic startup and operation, and covers common work activities associated with excavators.

**Motor Graders** (40 Hours)
  (Module ID 22305-14) Identifies and describes the common uses and types of motor graders. Presents safety guidelines, prestart inspection procedures, and preventive maintenance requirements. Describes basic startup and operation, and covers common work activities associated with motor graders.