

Heavy Equipment Operation and Maintenance



Work outdoors and always be part of something big!



Prepare for a commercial driver's license (CDL) and learn skills required by heavy equipment operators for construction, landscaping and highway industries, as well as maintenance and repair of construction-related equipment.

Units of Study

- Basic Operating Techniques
- Orientation to the Trade
- Identification of Heavy Equipment
- Introduction to Hand & Power Tools
- Welding/ Oxy-Acetylene Torching
- Preventative Maintenance of Heavy Equipment
- Career and Financial Management
- Career Exploration
- Basic Employability & Leadership Skills
- CDL General Knowledge Exam Prep
- CDL Airbrake Prep
- Certified Excavator Program Training

Integrated Academics

- English

Licensing / Industry- Based Certifications

- American Red Cross First Aid/CPR/AED Certification
- NCCER Certifications for Core and Level 1 Heavy Equipment Operations Modules
- OSHA 10 Construction Industry
- Dig Safely New York, Inc. Certified Excavator Program (CEP) in Safe Digging Best Practices
- Prepare for NYS CDL Class B Permit Exam

Work-Based Learning

CTE programs bring students into the workplace for real life experiences. Businesses that supports our Heavy Equipment Operation and Maintenance program:

- Brodner Equipment
- The Dolomite Group
- Homesteads for Hope
- Monroe County Parks
- Monroe Tractor
- Spencerport Volunteer Fireman's Assoc.

Articulation Agreements

Alfred State



Career Outlook

All CTE programs correlate to many careers paths. Use the links below to explore more. One example:

Job Projections for Construction Equipment Operator: 12% projected growth in New York State jobs 2016-2026.

New York State salary range:
\$44,830 entry level- \$96,030 experienced

Education Requirements: Many workers attend a career and technical education program; others learn through an apprenticeship or on the job training.

Explore more:

<https://www.careerzone.ny.gov/>
<https://www.onetonline.org/find/>



WEMOCO Career & Technical Education Center
Monroe 2-Orleans Board of Cooperative Educational Services
Monroe2BOCES.org/cte 585-352-2471
3589 Big Ridge Road, Spencerport, New York 14559



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Employability Profile

<u>Career Readiness</u>	<u>Basic Safety</u>	<u>Basic Operational Techniques</u>	<u>Excavators</u>
Attendance _____	Use PPE (Personal Protective Equipment) _____	Use personal protective equipment _____	Perform basic earthmoving and excavation operations with an excavator _____
Punctuality _____	Identify workplace hazards _____	Mount and dismount equipment using 3 points of contact _____	Trench to +/- .2 ft with an excavator _____
Appropriate Workplace appearance _____	Read and interpret MSDS (Material Safety Data Sheets) _____	Start, warm-up and shut down various types of heavy equipment _____	Bench load a truck with an excavator _____
Takes Initiative _____	Dress appropriately for the job and conditions _____	Perform pre-operational walk around inspection _____	
High Quality of work _____	Select and use fire extinguishers _____	Accurately complete daily pre-op check sheet _____	
Knowledge of workplace ethics _____	Use proper hearing protection _____	Log equipment usage _____	
Responsive to supervisor _____	Use proper lifting techniques _____	Perform basic operational movement _____	
Effective Communication skills _____			
Solves problems _____			
Makes decisions _____			
Cooperates with others _____			
Resolves conflict _____			
Observes critically _____			
Takes responsibility for learning _____			
Reads with understanding _____			
Solves problems using math _____			
Complies with health and safety rules _____			
Uses technology appropriately _____			

<u>Orientation to the Trade</u>	<u>Basic Communication Skills</u>	<u>Advanced Operational Techniques</u>	<u>Bulldozers</u>
Displays characteristics of a good operator _____	Speak in front of a group _____	Calculate cycle time _____	Perform basic earthmoving and excavation operations with a dozer _____
Uses trade terminology _____	Use of hand signals _____	Interpret accident reports _____	Grade to +/- .2 ft with a dozer _____
Explores careers in the trade _____	Use of electronic communication devices _____	Inspect a job-site for safety _____	Cut a drainage swail with a dozer _____
	Write legibly _____		

<u>Identification of Heavy Equipment</u>	<u>Introduction to Construction Math</u>	<u>Grades</u>	<u>Dump Trucks</u>
Identify various types of equipment _____	Add, subtract, multiply, and divide whole numbers and decimals _____	Match types of stakes to their correct usage _____	Safely operate a 1 ton and a large dump truck _____
Select the proper machine to match the job _____	Measure distance with a tape measure and a wheel _____	Check finish subgrade on a cross slope _____	Back-up using only mirrors _____
	Determine volume of an excavation _____	Check horizontal and vertical distance of cut and fill slope stakes _____	Inspect load for balance, weight, and hazards before moving the truck _____
	Determine rise or fall with a transit _____		Back up and dump a load in a designated spot _____
	Determine rise or fall with a laser _____		

<u>Introduction to Hand Tools</u>	<u>Introductory Skills for the Crew Leader</u>	<u>Backhoes</u>	<u>CDL General Knowledge</u>
Identification of hand tools _____	Estimate materials for a job _____	Perform basic maneuvers on a backhoe _____	Perform a 7 step pre-trip inspection _____
Selection of hand tools _____	Select equipment for a job _____	Trench to +/- .2 ft with a backhoe _____	Operate trucks with manual and automatic transmissions _____
Proper use of hand tools _____	Lead a crew to complete a project _____	Load a truck with a backhoe _____	Parallel park a commercial motor vehicle _____
Care of hand tools _____		Backfill an excavation with a backhoe _____	Straight line back a commercial motor vehicle _____
		Perform preventive maintenance on a backhoe _____	Back a truck using mirrors _____
			Pass a sample CDL General Knowledge test with a minimum score of 80 _____

<u>Introduction to Power Tools</u>	<u>Loaders</u>	<u>CDL Air Brakes</u>
Select the proper power tool for the application _____	Perform basic maneuvers with various types of loaders _____	Operate a truck with air brakes _____
Inspect the power tool for safety _____	Load trucks in a safe and productive manner _____	Perform preventive maintenance on an air brake system _____
Use the power tool safely _____	Stockpile material with a loader _____	Pass a sample CDL air brake endorsement test with a minimum score of 80 _____
Demonstrate proper maintenance of power tools _____	Manage loading area between loads _____	

<u>Welding/Oxy-Acetylene Torches</u>	<u>Preventive Maintenance</u>
Select and use proper PPE _____	Locate service intervals for equipment _____
Set up welding and torching equipment _____	Schedule maintenance for equipment _____
Strike an arc and run straight consistent beads with an arc welder _____	Perform preventive maintenance on a piece of equipment _____
Make straight cuts in various thicknesses of steel with a cutting torch _____	Follow procedures in maintenance manuals _____
Shut down welding and torching equipment properly _____	Log maintenance performed on service logs _____