

**Course Title: Forestry Equipment**

<b>Unit: 1</b>	<b>Career Opportunities</b>
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<b>Content Standard(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <ol style="list-style-type: none"> <li>1. Examine careers in sales and service of forestry equipment.</li> </ol>
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<b>Learning Objective(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <ol style="list-style-type: none"> <li>1. Identify available jobs in forestry relating to equipment.</li> <li>2. Describe the duties associated with available jobs.</li> <li>3. Discuss educational requirements for available jobs in forestry relating to equipment.</li> <li>4. Compare benefits of available jobs in forestry relating to equipment.</li> </ol>
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<b>Essential Question(s):</b>	<p>What criteria should a student use in selecting a career path?          What resources are available to students conducting a job search?</p>
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<b>Content Knowledge</b>	<b>Suggested Instructional Activities Rigor &amp; Relevance Framework (Quadrant)</b>	<b>Suggested Materials, Equipment and Technology Resources</b>
<p>I. Career</p> <ol style="list-style-type: none"> <li>A. Define work</li> <li>B. Employee benefits                             <ol style="list-style-type: none"> <li>1. Insurance                                     <ol style="list-style-type: none"> <li>a. Major Medical</li> <li>b. Dental</li> <li>c. Vision</li> </ol> </li> <li>2. Retirement plans                                     <ol style="list-style-type: none"> <li>a. 401K</li> <li>b. Stock options</li> </ol> </li> </ol> </li> </ol>	<p>Research paper                      Job applications                      Cover letter                      Résumé                      Mock job interview</p>	<p>PowerPoint Presentation                      Computer                      Multimedia projector                      Internet access                      Sample job application</p>

<b>Unit Assessment:</b>	Tests, performance tasks, demonstrations, teacher observations
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<b>Unit/Course CTSO Activity:</b>	The content enforces leadership skills through career exploration. Participate in the Forestry Career Development Event.
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<b>Unit/Course Culminating Product:</b>	Students will become hireable citizens after gaining the knowledge of careers.
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<b>Course/Program Credential(s):</b> <input type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree <input type="checkbox"/> Other:
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**Course Title: Forestry Equipment**

<b>Unit: 2</b>	<b>Safety</b>
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<b>Content Standard(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <ol style="list-style-type: none"> <li>2. Recognize the need for safety clothing and gear used in the forestry industry.             <ul style="list-style-type: none"> <li>• Identifying safe practices in the forestry mechanics industry</li> <li>• Describing the safe operation and maintenance of forestry equipment</li> </ul> </li> </ol>
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<b>Learning Objective(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <ol style="list-style-type: none"> <li>1. Identify potential hazards in the forest industry.</li> <li>2. Identify safety equipment used in forest industry.</li> </ol>
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<b>Essential Question(s):</b>	<p>What are some of the hazards faced by individuals working in forestry?          What is some of the safety equipment used by foresters?</p>
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<b>Content Knowledge</b>	<b>Suggested Instructional Activities Rigor &amp; Relevance Framework (Quadrant)</b>	<b>Suggested Materials, Equipment and Technology Resources</b>
<p>I. Safety</p> <ol style="list-style-type: none"> <li>A. Need for safety clothing and gear</li> <li>B. Safe practices, operations, and maintenance</li> </ol>	<p>PowerPoint Presentation            Virtual field trip using safety videos</p>	<p>LCD projector            Computer            Whiteboards            DVD/VCR player            Safety videos            textbook</p>

<b>Unit Assessment:</b>	Participation in class discussion, participation in shop hazard identification, and safety test (100% mastery)
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<b>Unit/Course CTSO Activity:</b>	<p>Incorporate safety practices into student's SAE project.          Participate in the Forestry Career Development Event.</p>
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**Unit/Course  
Culminating  
Product:**

Students will master shop safety by identifying mock safety hazards in the shop and by passing the safety portion of the lesson with a 100 on the shop safety test.

**Course/Program Credential(s):**  Credential  Certificate  Postsecondary Degree  University Degree  
 Other:

**Course Title: Forestry Equipment**

<b>Unit: 3</b>	<b>Large Equipment</b>
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<b>Content Standard(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <ol style="list-style-type: none"> <li>3. Compare uses of tree harvesting equipment. Examples: skidder, loader, cutting machine, delimeter</li> <li>4. Identify road and fire lane maintenance equipment. Examples: bulldozer, road grader</li> </ol>
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<b>Learning Objective(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <ol style="list-style-type: none"> <li>1. Identify tree harvesting equipment and their uses.</li> <li>2. Identify equipment used for making and maintaining roads and fire lanes.</li> </ol>
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<b>Essential Question(s):</b>	What equipment is commonly used in the forest industry?
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<b>Content Knowledge</b>	<b>Suggested Instructional Activities Rigor &amp; Relevance Framework (Quadrant)</b>	<b>Suggested Materials, Equipment and Technology Resources</b>
<ol style="list-style-type: none"> <li>I. Large equipment               <ol style="list-style-type: none"> <li>A. Tree removal equipment                   <ol style="list-style-type: none"> <li>1. Skidder</li> <li>2. Loader</li> <li>3. Cutting machine</li> <li>4. Delimeter</li> </ol> </li> <li>B. Earth moving equipment                   <ol style="list-style-type: none"> <li>1. Bulldozer</li> <li>2. Road grader</li> <li>3. Excavator</li> </ol> </li> </ol> </li> </ol>	PowerPoint Presentation Virtual field trip using videos Field trip to logging site	LCD Projector Computer Whiteboards Videos Transportation to site Cooperating site

<b>Unit Assessment:</b>	Participation in class discussion, teacher observation, tests
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**Unit/Course  
CTSO Activity:**

Participate in the Forestry Career Development Event.

**Unit/Course  
Culminating  
Product:**

**Course/Program Credential(s):**  Credential  Certificate  Postsecondary Degree  University Degree  
 Other:

## Course Title: Forestry Equipment

<b>Unit: 4</b>	<b>Small Equipment</b>
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<b>Content Standard(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <ol style="list-style-type: none"> <li>5. Demonstrate the use of forestry hand tools, including pruning saws, bow saws, loppers, and brush cutters.</li> <li>6. Identify sharpening techniques for chain saws, axes, pruners, and pole saws.</li> <li>7. Identify types of urban forestry equipment, including tree climbing equipment and tree moving equipment.</li> <li>8. Explain common techniques of chain saw maintenance.             <ul style="list-style-type: none"> <li>• Identifying major components of a chain saw</li> <li>• Differentiating types of chains used on a chain saw</li> </ul> </li> </ol>
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<b>Learning Objective(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <ol style="list-style-type: none"> <li>1. Identify common forestry hand tools.</li> <li>2. Demonstrate sharpening of chain saws, axes, pruners, and pole saws.</li> <li>3. Identify equipment commonly used in urban forestry such as climbing and tree removal apparatuses.</li> <li>4. Perform chainsaw maintenance.</li> </ol>
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<b>Essential Question(s):</b>	<p>What are the uses of common hand tools?          How do I sharpen chain saws, axes, pruners, and pole saws?          What type of equipment is used in the urban forest?          What maintenance should regularly be done on chain saws?</p>
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
<ol style="list-style-type: none"> <li>I. Small equipment               <ol style="list-style-type: none"> <li>A. Hand tools                   <ol style="list-style-type: none"> <li>1. Pruning saws</li> <li>2. Bow saws</li> <li>3. Loppers</li> <li>4. Brush cutters</li> </ol> </li> <li>B. Sharpening small equipment                   <ol style="list-style-type: none"> <li>1. Chain saws</li> <li>2. Axes</li> <li>3. Pruners</li> <li>4. Pole saws</li> </ol> </li> <li>C. Urban forestry equipment</li> </ol> </li> </ol>	<p>Memorization            Demonstration            Work-based learning            PowerPoint Presentation            Collaborative learning            Guided practice</p>	<p>Pruning saw            Bow saw            Loppers            Brush cutter            Chain saw            Axe            Anvil and bypass pruners            Pole saw            Sharpening tools            Computer            Projector            Climbing equipment</p>

<ul style="list-style-type: none"> <li>1. Climbing equipment</li> <li>2. Tree removal tools</li> <li>D. Chainsaws <ul style="list-style-type: none"> <li>1. Components</li> <li>2. Maintenance</li> <li>3. Types of chainsaws</li> </ul> </li> </ul>		Tree removal equipment Tool set
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<b>Unit Assessment:</b>	Participation in class discussion, teacher observation, tests, performance evaluation
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<b>Unit/Course CTSO Activity:</b>	Participate in the Forestry Career Development Event.
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<b>Unit/Course Culminating Product:</b>	
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<b>Course/Program Credential(s):</b> <input checked="" type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree <input type="checkbox"/> Other:
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**Course Title: Forestry Equipment**

<b>Unit: 5</b>	<b>Engine Maintenance</b>
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<b>Content Standard(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <p>9. Identify systems that require inspection before engine operation.</p> <p>10. Describe preparation of forestry equipment for storage.                  Examples: draining fluids, lubricating</p>
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<b>Learning Objective(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <p>1. Identify common maintenance practices associated with major engine systems.</p>
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<b>Essential Question(s):</b>	What are some common maintenance practices carried out on engine systems?
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<b>Content Knowledge</b>	<b>Suggested Instructional Activities Rigor &amp; Relevance Framework (Quadrant)</b>	<b>Suggested Materials, Equipment and Technology Resources</b>
<p>I. Engine Maintenance</p> <p>A. Systems</p> <ol style="list-style-type: none"> <li>1. Ignition system</li> <li>2. Fuel system</li> <li>3. Compression system</li> <li>4. Cooling system</li> <li>5. Lubrication system</li> <li>6. Air intake system</li> </ol> <p>B. Preparation of equipment storage</p> <ol style="list-style-type: none"> <li>1. Visual inspection of systems</li> <li>2. Performing needed repairs</li> <li>3. Draining fluids</li> <li>4. Lubricating</li> <li>5. Other</li> </ol>	<p>Lecture</p> <p>Demonstrations</p> <p>Experiments</p> <p>Field trips/virtual field trip using video</p> <p>Flash cards</p> <p>Games</p> <p>Guided practice</p> <p>Laboratory</p> <p>Research</p> <p>Worksheets</p> <p>Guest Speakers</p> <p>5 + 1</p>	<p>Whiteboard</p> <p>Textbook</p> <p>Computer</p> <p>PowerPoint Presentation</p> <p>VCR/DVD player</p> <p>LCD projector</p> <p>Internet</p> <p>Engine</p> <p>Tractor</p>

<b>Unit Assessment:</b>	Participation in discussion, tests, quizzes, teacher observations, pop tests, open-ended questions, essays, research projects
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<b>Unit/Course CTSO Activity:</b>	Participate in the Forestry Career Development Event.
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<b>Unit/Course Culminating Product:</b>	
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<b>Course/Program Credential(s):</b> <input type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree <input type="checkbox"/> Other:
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**Course Title: Forestry Equipment**

<b>Unit: 6</b>	<b>Hydraulics</b>
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<b>Content Standard(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <p>11. Describe uses of hydraulic systems in the forestry industry.</p> <ul style="list-style-type: none"> <li>• Identifying basic components of a simple hydraulic system</li> <li>• Comparing advantages and disadvantages of using a hydraulic system</li> </ul>
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<b>Learning Objective(s) and Depth of Knowledge Level(s):</b>	<p>Students will:</p> <ol style="list-style-type: none"> <li>1. Define hydraulics and explain its major operating systems.</li> <li>2. Discuss the basic principles of hydraulics.</li> <li>3. Describe the primary components of a hydraulic system.</li> <li>4. Describe the advantages and disadvantages of hydraulic systems.</li> </ol>
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<b>Essential Question(s):</b>	<p>What is hydraulics and what are its major operating systems?</p> <p>What principles govern the use of hydraulics?</p> <p>What are the primary components of a hydraulic system?</p> <p>What are the advantages and disadvantages associated with hydraulic systems?</p>
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<b>Content Knowledge</b>	<b>Suggested Instructional Activities Rigor &amp; Relevance Framework (Quadrant)</b>	<b>Suggested Materials, Equipment and Technology Resources</b>
<p>I. Hydraulics</p> <p>A. Two major operating systems</p> <ol style="list-style-type: none"> <li>1. Hydrodynamics</li> <li>2. Hydrostatics</li> </ol> <p>B. Basic principles</p> <ol style="list-style-type: none"> <li>1. Pascal's Law</li> <li>2. Multiplication of force</li> <li>3. Cycle time</li> <li>4. Law of Conservation of Energy</li> </ol> <p>C. Primary components</p> <ol style="list-style-type: none"> <li>1. Reservoir</li> <li>2. Strainer and filter</li> <li>3. Pump</li> </ol>	<p>Lecture</p> <p>5 + 1</p> <p>Research</p> <p>Lecture and discussion</p> <p>Field trip/virtual field trip using video</p> <p>Flash cards</p> <p>Worksheets</p> <p>Guest speakers</p> <p>Demonstration</p> <p>10 + 2</p>	<p>Whiteboard</p> <p>Textbook</p> <p>Computer</p> <p>PowerPoint Presentation</p> <p>LCD projector</p> <p>VCR/DVD Player</p> <p>Internet</p> <p>Tractor</p>

<ul style="list-style-type: none"> <li>4. Pressure gauge</li> <li>5. Pressure relief valve</li> <li>6. Hydraulic actuator</li> <li>7. Piping and connectors</li> </ul> <p>D. Advantages and disadvantages</p> <ul style="list-style-type: none"> <li>1. Advantages <ul style="list-style-type: none"> <li>a. Increased flexibility</li> <li>b. Variable speed</li> <li>c. Multiplication of force</li> <li>d. Reduced wear</li> <li>e. Reversibility</li> </ul> </li> <li>2. Disadvantages <ul style="list-style-type: none"> <li>a. High pressures</li> <li>b. Need for cleanliness</li> <li>c. Safety hazards</li> </ul> </li> </ul>		
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<b>Unit Assessment:</b>	Participation in discussion, tests, quizzes, teacher observations, pop tests, open-ended questions, essays, research projects
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<b>Unit/Course CTSO Activity:</b>	This course will be useful to enhance knowledge in various career development events including small engines, tractor driving, compact tractor driving, forestry, and agricultural mechanics.
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<b>Unit/Course Culminating Product:</b>	Students will be knowledgeable of in safe handling and maintenance of forestry equipment.
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<b>Course/Program Credential(s):</b> <input type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree <input type="checkbox"/> Other:
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