UNIVERSITY OF MINNESOTA

Safety requirements for chain saws, chippers, and brush cutters

Version 1.2
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PURPOSE

The purpose of this document is to establish minimum safety-related requirements for the use of chain saws, chippers, and powered brush cutters throughout the University of Minnesota.

SCOPE AND APPLICATION

The requirements set forth in this document shall apply whenever any University employee or student, acting within the scope of their work, academic/educational, or research responsibilities, uses any of the equipment listed below, regardless of purpose.

- Chain saws including pole-mounted chain saws or "powered pole saws". See "Definitions".
- Tree/branch chippers
- Brush cutters

When this equipment is used for logging purposes (as defined in "Definitions") additional requirements apply. See section 1.

DEFINITIONS

"Blowdown." A grouping of trees or large branches downed by wind or other weather conditions, which are entangled, in contact with each other, or otherwise situated in a way that presents hazards such as spring poles, compression, and tension. For the purposes of this program, blowdown does not include single, isolated trees or branches, or multiple trees which have been downed due to wind or weather, but are not arranged as described above.

"Brush cutter." Machines which utilize a metal saw blade(s) to cut brush, tree trunks, and vegetation, usually up to four inches in diameter, at ground level. Brush cutters resemble conventional string trimmers ("weed whips"), but they are larger, heavier, and utilize a metal blade instead of nylon string. Included in this definition are "brush mowers" which perform the same function, but are similar to a very large, heavy duty walk-behind lawn mower.

Figure 1. An example of a brush cutter.

Figure 2. An example of a walk-behind brush cutter.

"Buck." To cut a felled tree into logs.

"Butt." The bottom of the felled part of a tree or branch.

"*Drop start*" or "*Drop starting*." The act of starting a chainsaw by pushing the saw away from the body with one hand while simultaneously pulling the starter cord with the other.

"Fell (fall)." To cut down trees.

"Logging" or "Logging Operations." Operations associated with felling and moving trees and logs for the purpose of harvesting them for economic gain and/or academic/educational purposes. This includes, but is not limited to; marking danger trees and trees/logs to be cut to length, felling, limbing, bucking, debarking, chipping, yarding, loading, unloading, storing, and transporting machines, equipment and personnel which are to be used for the purpose of harvesting trees and/or logs for economic gain and/or academic/educational purposes.

"Powered." A piece of equipment powered by gasoline or other fuel, or electricity, including a battery or batteries.

"Powered pole saw." A powered chain saw which is mounted at the end of a pole, allowing the operator to reach elevated areas from the ground. This can also be called a pole saw. For the purposes of this program, powered pole saws are considered chain saws.

"Scabbard." A scabbard covers the chain and bar of a chain saw when the saw is in storage or being transported. It also protects the chain from damage, for instance blunting by contact with concrete floors.

"Spring pole." A tree, segment of a tree, limb, or sapling which is under stress or tension due to the pressure or weight of another object, including another tree or limb.

"Unqualified person." A person who has little or no formal training and education in electrical safety, and who is not qualified to work on/near exposed, energized electrical parts or conductors, such as overhead power lines.

PROGRAM ELEMENTS

1. LOGGING OPERATIONS

1.1 General. When equipment covered by this program is used for logging or logging operations (See "Definitions"), OSHA's logging standard (29 CFR 1910.266) shall be complied with.

2. EQUIPMENT REQUIREMENTS

2.1 General requirements for all equipment. Equipment covered by this program shall be free of defects or unauthorized modifications which compromise safety. All guards and safety features shall be provided and working correctly.

2.2 Minimum safety requirements for chain saws. Chain saws manufactured after 1995 must be equipped with a chain brake and a protective device that minimizes chain saw kickback and meets the requirements of ANSI B175.1 –1991 "Safety Requirements for Gasoline-Powered Chain Saws."

Chain saws will be operated and maintained in accordance with manufacturer's instructions.

Chain saws shall be equipped with chain catchers.

Figure 3. A chain catcher.

Figure 4. A chain brake/kickback protection device.

2.3 Minimum safety requirements for chippers. At a minimum, chippers shall be equipped with the following safety features:

- Feed control bar and/or "panic bar" which acts as an emergency stop by stopping and/or reversing the feed rollers. The feed control bar shall be located such that an employee who is being pulled into the chipper would be able to reach it and activate it.
- Flexible rubber curtains or flaps installed at the front of the infeed chute. These flaps may help to prevent operators from being pulled into the machine, but primarily prevent objects from being ejected from the chipper and striking the operator or others.
- Discharge spout deflector
- Chipper hood safety latch

3. EQUIPMENT INSPECTIONS

3.1 General. All equipment covered by this program shall be inspected prior to each day's use. If deficiencies are noted upon inspection at any time, the equipment shall be removed from service until repaired.

3.2 Specific requirements for inspection of chain saws. For chain saws, the inspection shall consist of at least the following items:

- Chain brake
- Throttle trigger and throttle trigger interlock (lockout)
- Chain catcher
- Handles and guards
- Correct chain number, pitch, and gauge for work
- Chain tension
- Chain lubrication
- Chain sharpness
- Chain depth gauge setting and shape are set correctly
- Guide bar for wear and damage
- Proper idling (i.e. chain does not move while engine is idling)
- Anti-vibration elements
- Fuel and bar oil systems are tight (no leaks)

4. JOB SITE INSPECTION AND ARRANGEMENT

4.1 General requirements. Work sites where chain saws, chippers, brush cutters, and related equipment are in use shall be arranged so that the actions of one individual will not create a hazard for any other individual.

To the extent allowed by the work at hand, and the geographical constrictions of the work area, the worksite should be set up such that:

- Chain saws, chippers, and brush cutters are used at least 20 feet from the fueling area.
- The distance between adjacent occupied work areas or nearest person is at least two tree lengths from the trees being felled (if applicable).
- Individuals are not working under, or near activities performed overhead.
- A spotter is designated to ensure that no one enters the work area during cutting activities. The spotter must stand in an area clear of any falling debris.
- Individuals are working in a position or location that is within visual or audible contact with other workers.
- No one is to approach a feller closer than two tree lengths of trees being felled until the feller has acknowledged that it is safe to do so.
- When felling a tree, at least two paths of escape shall be designated and cleared of all brush and other obstacles. These paths should generally be 45 degrees from the stump, in the opposite direction of the planned fall.

- If a wood chipper is used, it must be placed in an area where branches and limbs will not strike employees feeding it, and at least two tree lengths from any trees being felled.
- At the end of each work shift all personnel must be accounted for.

4.2 Unguarded, energized overhead power lines. When an unqualified person is working on the ground, or in an elevated position near overhead lines, their location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead power lines than the following distances:

For voltages 50kV or below	10 feet
For voltages over 50kV	10 feet plus 4 inches for every 10kV over 50kV

For the purposes of this program, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

4.3 Ladders and step stools. Chain saws may not be used from ladders, step-stools, scaffolds, or similar elevated surfaces, except that properly qualified tree climbers who are tied into trees during operations may use ladders as long as they are adequately secured with two points of attachment to prevent ladder upset.

4.4 Carbon Monoxide. Chain saws and other equipment covered by this program and capable of producing Carbon Monoxide shall not be started or run in areas where insufficient ventilation may exist, such as closed, or partially closed buildings and rooms.

4.5 Aerial lifts. Aerial lifts, bucket trucks and similar equipment may only be operated by trained, authorized individuals and only in compliance with the University of Minnesota Aerial Lift Safety program, OSHA requirements, manufacturer's instructions and other best practices.

4.6 Working alone. Working alone while operating equipment covered by this program is discouraged. However, working alone is prohibited while felling trees, clearing blowdown or while engaged in logging activities (see "Definitions" and section 1). When employees work alone, provisions must be made to ensure that person has means to summon emergency assistance when necessary. This may include ensuring that the person has a cell phone available within close reach while working (assuming adequate cellualr coverage in the work area).

4.7 First aid supplies. First aid supplies meeting the requirements of section 8 shall be provided at the worksite.

5. SAFE WORK PRACTICES FOR CHAIN SAWS

5.1 General requirements. Chain saws shall be started, operated, stored, transported, maintained, repaired and refueled as specified by the manufacturer and as directed in this section.

5.2 Starting the chain saw. Before starting the chain saw, the operator shall ensure that all other individuals are safely positioned and that the chain brake is engaged. Chain saws shall be started while held firmly on the ground with the operator's foot placed through the handle (to the extent possible), or while held firmly between the legs. Chain saws shall not be "drop-started".

Figure 5. Acceptable starting method.

Figure 6. Acceptable starting method.

5.3 Proper hand grip on top-handled chain saws. While cutting or carrying short distances (see section 5.8), chain saws shall be held with two hands. During cutting, operators shall grasp the forward/top handle, with the left thumb wrapped entirely around the handle, and the right hand firmly gripping the rear handle in the same manner.

Figure 7. Proper hand grip for top-handled chain saw.

5.4 Refueling the chain saw. Chain saws shall be fueled at least 20 feet from any open flame or other source of ignition. Chain saws shall not be refueled while running. During refueling, the chain brake shall be engaged. Precautions, such as using a funnel , shall be taken to prevent environmental damage and gasoline from spilling onto hot parts, such as the chain saw's exhaust. Chain saws and gas containers shall be placed on the ground during refueling.

5.5 Cutting overhead and use of ladders. Chain saws may not be used to cut overhead (no part of the saw may be above shoulder height of the operator). Chain saws may not be used from ladders, scaffolds, or similar surfaces. See section 4.3.

5.6 Footing. To the extent permitted by the work, and except when working aloft, chain saws may only be used when the operator has two feet firmly in contact with stable, substantially level ground.

5.7 Kickback protection. The operator shall not use the upper part of the nose of the bar for cutting, as this creates significant risk of "kickback".

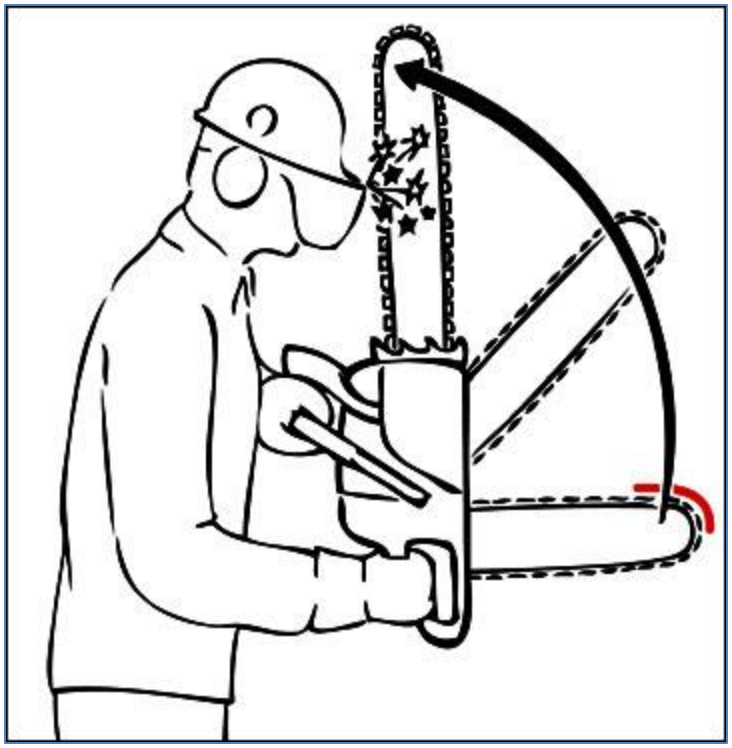

Figure 8. The top half of the nose of the bar is known as the "kick back zone".

5.8 Body positioning. While cutting, the operator shall position his/her body such that it is offset to the left side of the chain saw.

Figure 9. Proper body positioning.

5.9 Walking with chain saw. When walking with a chain saw, the following requirements shall apply:

Two steps or less	● Chain saw may be carried with engine running at idle speed and chain brake not engaged. ● Chain saw must be carried with both hands as described in section 5.3.
More than two steps but less than 20 feet	● Chain brake must be engaged OR saw must be off with chain brake engaged. ● Chain saw must be carried with bar pointed behind the operator.
20 feet or more	● Chain brake must be engaged ● Saw must be off ● Chain saw must be carried with bar pointed behind the operator.

5.10 Transporting and storing chain saws. When transporting and/or storing chain saw, for example at the conclusion of the work, the operator shall ensure that:

- The chain saw shall be shut off with the chain brake engaged.
- Scabbards shall be used to cover the bar and chain while in transport. Hard-sided carrying cases are recommended.
- Chain saws may not be transported in the passenger compartments of vehicles. For the purposes of this program, the passenger compartment of a Sport Utility Vehicle (SUV), station wagon, or hatchback extends from the backrest of the rear seat, forward.
- Hot chain saws shall not be stored near flammables or combustibles.

5.11 Felling trees. When felling trees, individuals shall ensure that:

- Felling is not conducted in a manner that may create a hazard for anyone.
- When felling a tree, at least two paths of escape shall be designated and cleared of all brush and other obstacles. These paths should generally be 45 degrees from the stump, in the opposite direction of the planned fall, or 135 degrees from the direction of the intended fall. Each path shall be at least 15 feet long.
- Refueling area is at least 20 feet away.
- Domino felling of trees including danger trees is prohibited.
- Danger trees (including lodged and snag trees) are removed using techniques that minimize personnel exposure before work is commenced in the area of the danger tree. If the danger tree is not felled or removed, the area needs to be marked and no work can be conducted within two tree lengths of the danger tree unless it can be demonstrated that a shorter distance will not create a hazard for an employee.

- Each danger tree is carefully checked for signs of loose bark, broken branches, and limbs, or other damage before they are felled or removed. Accessible loose bark and other damage that may create a hazard for the feller or others shall be removed or held in place before felling or removing the tree.
- When a spring pole or other tree under stress is cut, no one other than the feller shall be closer than two tree lengths from where the stress is released.
- Supervisors are consulted when unfamiliar or unusually hazardous conditions exist.
- Prior to beginning a final, felling cut, the operator shall verify that all personnel are safely located, and shall make a loud, verbal announcement, such as "TIMBER" or "FELLING CUT". This announcement may be supplemented (but not replaced by) hand signals or other visual communication.

6. SAFE WORK PRACTICES FOR CHIPPERS

6.1 General requirements. Chippers shall be operated, stored, transported, maintained, repaired and refueled as specified by the manufacturer and as directed in this section.

6.2 Starting the chipper. Prior to starting the chipper, the operator shall verify that:

- The chipper's disc hood is closed and latched and that there are no foreign objects in the infeed area.
- The discharge chute is properly positioned and secured in place to ensure individuals are not struck by discharge.
- All individuals are in safe positions, clear of any hazards such as moving parts, or ejected materials.
- The chipper is secured against unintended movement with wheel chocks or equivalent. A chipper which is properly hitched to a towing vehicle, which has its parking brake set is considered adequately protected from unintentional movement.

6.3 Safety monitor. Whenever possible, a specific person shall be designated as a safety monitor. The safety monitor's <u>sole responsibility</u> is to monitor the loading of material into the chipper and to activate the emergency stop controls if an employee becomes entangled.

6.4 Work positions. Individuals operating the chipper shall stand to the side of the chipper infeed to lessen the chance of being struck by materials ejected from the chipper and to have faster access to emergency stopping features. No individual may stand, sit, climb on, or lean against any part of the chipper while it is running.

6.5 Feeding material into chipper. Operators and other individuals shall keep all body parts, especially hands, away from intake rollers, cutting knives and other hazardous parts of the chipper.

When operating a chipper that is parked on a road, it shall be fed from the curb side away from traffic.

Branches shall be fed into chipper “butt end” first.

If necessary to push materials into the intake rollers, a wooden push tool or another branch shall be used.

Shorter branches shall be laid on top of longer branches while being fed into chipper.

All materials fed into chipper shall be visually inspected prior to feeding, to ensure they do not contain metal objects or other foreign materials. To the extent possible, operators feeding the chippers shall avoid looking at the feeding process to avoid eye injuries from ejected materials.

Except as noted elsewhere in this program, only one operator at a time shall be engaged in feeding the chipper.

Smaller objects should be discarded in trash rather than being fed into chipper.

6.6 Clearing jams. Whenever possible, jams shall be cleared using tools, branches, etc. so that the operator needn’t place any part of their body in a hazardous portion of the machine.

If manual clearing is necessary, the chipper shall be shut down, and the person clearing the jam shall visually check the cutting disc, intake rollers and other moving parts to ensure that they have come to a complete stop. The key shall be removed and placed under the exclusive, physical control of the person clearing the jam. Locking pins and other safety features shall be engaged to lock the cutting disc in place. The chipper may only be restarted by the person who cleared the jam.

6.7 Leaving the chipper unattended. When leaving the chipper unattended, such as at the end of the workday, keys shall be removed and the chipper shall be protected from rolling with wheel chocks or equivalent. For the purposes of this program, leaving the chipper hitched to a towing vehicle whose parking brake is engaged, is considered adequate.

6.8 Discharge chute. The discharge chute shall be secured in the proper position prior to starting the chipper and throughout the course of the work. All individuals shall keep all parts of the body clear of the discharge chute and discharged materials. Individuals shall not reach into the discharge chute to clear jams, or for any other reason while the chipper is running.

7. PERSONAL PROTECTIVE EQUIPMENT (PPE) AND OTHER ATTIRE

7.1 General attire. Individuals may not wear clothing, jewelry, articles, or other attire which creates hazards to themselves or others. This includes, but is not limited to:

- Jewelry, especially dangling jewelry. This includes all rings, wedding bands, etc.
- Accessories which are worn around the neck, such as neckties, draw strings on "hoodies" or other clothing, necklaces, scarves, ID tags or lanyards.
- Accessories such as keys, headphones, phone belt clips, etc.
- Clothing (including high visibility articles) which are overly bulky, oversized, loose fitting, ripped or torn, unbuttoned/unsecured or otherwise hazardous.
- Shirts must be tucked into pants. Shirt sleeve cuffs must be snug.
- Hair, including facial hair, which is long enough to create hazards must be tied back or restrained when working with equipment that creates entanglement hazards.
- Jewelry, head scarves and other such articles which have religious significance may be worn at the discretion of the wearer, if accommodations are made to provide a level of safety equivalent to not wearing the articles.

7.2 Inspection of Personal Protective Equipment (PPE). All PPE must be inspected prior to each day's use. Damaged or compromised PPE shall be replaced immediately. This includes ballistic nylon chaps which have been compromised such that the ballistic material has been exposed or deployed.

7.3 PPE requirements. Minimum requirements for Personal Protective Equipment are provided in Appendix A. All required PPE shall be provided to employees, free of charge.

The requirements outlined in Appendix A are minimum levels of protection. Individual University departments or locations may develop their own site-specific requirements for Personal Protective Equipment (PPE), as long as those requirements are at least as stringent and protective as those provided in Appendix A, and as long as the required PPE is provided free of charge.

8. FIRST AID SUPPLIES

8.1 General requirements. At least one first aid kit shall be provided of sufficient size and contents for the number of people at the worksite. Kits and supplies shall be restocked as supplies are consumed.

8.2 Contents of first aid kits. Each first aid kit shall include at least the following:

- At least four gauze pads (at least 4 x 4 inches)
- At least two large gauze pads (at least 8 x 10 inches)
- Box adhesive bandages (band-aids)
- One package gauze roller bandage at least 2 inches wide

- Two triangular bandages
- Wound cleaning agent such as sealed moistened towelettes
- Scissors
- At least one blanket
- Tweezers
- Adhesive tape
- Latex gloves
- Resuscitation equipment such as resuscitation bag, airway, or pocket mask
- Two elastic wraps
- Splint

9. TRAINING

9.1 Overview of safety training requirements. Any individual who operates equipment covered by this program shall be required to successfully complete a training program meeting the requirements of this section. Note: Additional OSHA training requirements will apply to any work meeting the definition of "Logging" (See "Definitions").

9.2 Initial training. Individuals who operate equipment covered by this program must successfully complete initial training, prior to operating the equipment.

9.3 Refresher training. Refresher training shall be provided to each affected individual at least every three years, and more frequently if/when the individual's job performance indicates a need for retraining (i.e. he/she has been observed operating in an unsafe manner or has been involved in an accident or near miss).

Refresher training may be in the form of a brief synopsis of previous training.

9.4 Trainer qualifications. All training and evaluations shall be conducted by a suitably qualified instructor who is knowledgeable about this program and its requirements, applicable regulatory requirements, and the equipment at hand.

9.5 Documentation. All training shall be documented. Documentation shall include, at a minimum:

- Date(s) of training, including year and beginning and ending times
- Name of instructor
- Names and signatures of all participants
- An outline or brief synopsis of the material covered
- A statement indicating which participants are considered to have completed the courses successfully

See Appendix B for a recordkeeping form. Training documentation shall be maintained by the department, for at least three years from the date of training.

9.6 Classroom training. All training shall include a "classroom" component, which shall include at least the following topics (as applicable):

- Responsibilities of the operator
- Hazards of chain saws, including, but not limited to: Contact with chain (including from kick back), entanglement or strangulation, falls from trees, aerial lifts, etc., falling/flying objects (trees, tree limbs, equipment), weather-related hazards including heat stress, lightning, electrical hazards including overhead or underground power lines, noise, Carbon Monoxide, vibration-related conditions, burns from contact with hot surfaces
- Hazards of chippers, including but not limited to: Contact with cutting wheels and knives from reaching into hazardous parts or being entangled and pulled into machine, contact with intake rollers, struck by materials ejected from discharge chute, intake, or other parts of machine, weather-related hazards including heat stress, lightning, electrical hazards including overhead or underground power lines, noise, Carbon Monoxide, burns from contact with hot surfaces
- Hazards of brush cutters, including but not limited to: Contact with cutting blade(s), struck by materials thrown by blades, weather-related hazards including heat stress, lightning, electrical hazards including overhead or underground power lines, noise, Carbon Monoxide, burns from contact with hot surfaces
- How to minimize, eliminate or otherwise mitigate these and other hazards through the proper use of machine guarding, site set up, proper work practices, personal protective equipment, etc.
- The requirements of this program which are relevant to the individual's duties.
- Emergency procedures including how to shut off the equipment in an emergency and how to summon emergency assistance.

9.7 "Hands-on" demonstration and instruction. All training shall include a "hands-on" demonstration and instruction component, which shall include at least the following topics (as applicable):

- The various parts of the equipment in use, including components, hazards, controls, instrumentation, safety features, emergency stops, etc.
- Manufacturer warnings and limitations, from warning labels, manuals, etc.
- Proper methods for conducting inspections, as required by manufacturer
- Proper methods for starting, refueling, operating, maintaining, etc. In the case of chain saws, this shall include the chain brake and checking and adjusting chain tension.

9.8 Operator evaluation (<u>for chain saw operators only</u>). Individuals participating in training for chain saws shall be evaluated at the conclusion of training to verify they have understood and absorbed the information provided during training, and have the required level of competency.

For the initial training described in section 9.2, the evaluation shall consist of at least the following:

- Passing a written test (see sample in appendix C). A score of 80% is required to pass, and;
- "Hands on" performance evaluation consisting of tasks that the participant is likely to be required to perform.

For refresher training described in section 9.3, the evaluation shall consist of at least a written test (see appendix C). A "hands on" performance evaluation may be required at the discretion of the instructor. In determining whether or not the performance evaluation will be provided, the instructor shall consider factors including; the participants' general skill and experience, the frequency with which the participant uses the chain saw (less frequent use implies a greater need to include a skills evaluation), and the other factors as appropriate.

Participants who fail either of the evaluations or who for any reason, fail to satisfactorily complete the training, shall not be permitted to operate chain saws until they successfully complete the tests. Re-testing may be provided immediately after failing the test, at the instructor's discretion.

9.9 Training resources. For assistance in sourcing training services, contact University Health and Safety at (612)626-6002. Links to some online materials and videos are provided in Appendix D.

APPENDIX A: PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

<table>
<tr><th rowspan="2">Part of body</th><th colspan="3">Work activities covered by this program which involve chain saws</th><th rowspan="2">Work activities covered by this program but <u>NOT</u> involving chain saws</th></tr>
<tr><th>General usage</th><th>Climbing/working in trees</th><th>Aerial lift basket</th></tr>
<tr><td>Leg</td><td><u>Required</u>
Chain saw resistant chaps or chain saw resistant pants, which cover the full length of the leg</td><td colspan="3"><u>Required</u>
Long pants of denim or similar material, which cover the full length of the leg.

<u>Recommended when feasible</u>
Chain saw resistant chaps or pants, which cover the full length of the leg</td></tr>
<tr><td>Foot</td><td colspan="4"><u>Required during “Logging Operations” (See “Definitions”)</u>
Foot protection, such as heavy duty logging boots that are waterproof or water repellent and provide cover and support to the ankle, made of cut-resistant material is required; exception: during winter, insulated boots with toe-cap protection may suffice if insulated boots made of cut-resistant material are not available.

<u>Required for all other operations covered by this program but not meeting the definition of “Logging”</u>
At a minimum, 6” high leather boot with slip-resistant sole. Safety footwear with steel or composite toes is recommended. Steel toes are preferable over composite for chainsaw use.</td></tr>
<tr><td>Head</td><td><u>Required</u>
ANSI Z89-approved Type 1, Class E hard hat</td><td><u>Required</u>
ANSI Z89-approved Type 1, Class E hard hat <u>OR</u>
ANSI Z89-approved climbing helmet</td><td colspan="2"><u>Required</u>
ANSI Z89-approved Type 1, Class E hard hat</td></tr>
</table>

Eye and face	**Required** ANSI-approved safety glasses with side shields (fixed or removable) **AND** mesh or equivalent face shield integrated with hard hat	**Required** ANSI-approved safety glasses with side shields (fixed or removable). Mesh or equivalent face shield integrated with hard hat is optional	**Required** ANSI-approved safety glasses with side shields (fixed or removable) **AND** mesh or equivalent face shield integrated with hard hat	**Required** ANSI-approved safety glasses with side shields (fixed or removable)
Hearing	**Required** While operating machinery with a noise level of 85 db or greater: ear muffs **OR** inserts having a minimum Noise Reduction Rating (NRR) of 30. Using chain saw for one hour or less per day: ear muffs **OR** inserts having a minimum Noise Reduction Rating (NRR) of 30. Using chain saw for more than one hour per day: ear muffs having a minimum Noise Reduction Rating (NRR) of 20 **AND** inserts having a minimum Noise Reduction Rating (NRR) of 30. Note: Please contact University Health and Safety (UHS) at (612)626-6002 for assistance in determining noise levels			
High visibility clothing	**Required during logging operations, tree felling, or working on the ground within 50 feet of vehicular traffic or other mobile heavy equipment** High visibility shirt or vest (ANSI class II or better). Vest must be fastened closed to prevent entanglement. Shirts must be tucked into pants and free of rips, tears, etc.			
Hand	**Recommended** Wrist-length (non-gauntlet length) leather or utility gloves with vibration protection			

APPENDIX B: CHAIN SAW, CHIPPER AND BRUSH CUTTER SAFETY TRAINING DOCUMENTATION

Training Date	Time	Location	Trainer

Training outline

Classroom training

- Responsibilities of the operator
- Hazards of chain saws, including, but not limited to: Contact with chain (including from kick back), entanglement or strangulation, falls from trees, aerial lifts, etc., falling/flying objects (tree limbs, equipment), weather-related hazards including heat stress, lightning, electrical hazards including overhead or underground power lines, noise, Carbon Monoxide, vibration-related conditions, burns from contact with hot surfaces
- Hazards of chippers, including but not limited to: Contact with cutting wheels and knives from reaching into hazardous parts or being entangled and pulled into machine, contact with intake rollers, struck by materials ejected from discharge chute, intake, or other parts of machine, weather-related hazards including heat stress, lightning, electrical hazards including overhead or underground power lines, noise, Carbon Monoxide, burns from contact with hot surfaces
- Hazards of brush cutters, including but not limited to: Contact with cutting blade(s), struck by materials thrown by blades, weather-related hazards including heat stress, lightning, electrical hazards including overhead or underground power lines, noise, Carbon Monoxide, burns from contact with hot surfaces
- How to minimize, eliminate or otherwise mitigate these and other hazards through the proper use of machine guarding, site set up, proper work practices, personal protective equipment, etc.
- The requirements of this program which are relevant to the individual's duties.
- Emergency procedures including how to shut off the equipment in an emergency

"Hands-on" demonstration and instruction

- The various parts of the equipment in use, including components, hazards, controls, instrumentation, safety features, emergency stops, etc.
- Manufacturer warnings and limitations, from warning labels, manuals, etc.
- Proper methods for conducting inspections, as required by manufacturer
- Proper methods for starting, refueling, operating, refueling, maintening, etc. In the case of chain saws, this shall include the chain brake and checking and adjusting chain tension.

Written test (minimum passing score of 80%)

APPENDIX C: CHAIN SAW WRITTEN TEST

Name: **Date:**

Job title: **Location:**

Score:
Each question is one point. A minimum score of 80% (20/25) is considered "passing".

1. **Which of the following examples of chain saw usage would be covered by the University of Minnesota's policy on the use of chain saws, chippers, and brush cutters?**
   a. University employees using chain saws and chippers to clean up downed trees after a storm
   b. Forestry and arboriculture students using chain saws as part of their academic work
   c. Art department students creating artistic works from felled trees
   d. Theatre students using a chain saw in a play
   e. All of the above

2. **According to the University of Minnesota's policy on the use of chain saws; logging is defined as "Operations associated with felling and moving trees and logs for the purpose of _____ them for economic gain and/or academic/educational purposes."**
   a. Studying
   b. Harvesting
   c. Destroying
   d. Burning

3. **If an individual covered by the University of Minnesota's "Safety requirements for chain saws, chippers, and brush cutters" program, is engaged in "logging operations", they must follow the additional requirements found in OSHA's logging standard (1910.266).**
   a. True
   b. False

4. **Most chain saw, brush cutter, and chipper accidents result from lack of training, unsafe operation, or assuming a job is "too small" for appropriate PPE.**
   a. True
   b. False

5. **Which of the following is a recognized hazard of chain saw use?**
   a. Accidental contact with chain/blade, perhaps from kickback

b. Operator being struck by falling trees, branches, limbs
c. Clothing or jewelry snagged by moving chain
d. All of the above

6. All chain saws manufactured after 1995 must be equipped with a _____.

a. Panic Bar
b. Safety Latch
c. Throttle Trigger
d. Chain Brake

7. All chain saws must be equipped with chain catchers.

a. True
b. False

8. In general, employees may not place themselves, or any conductive object, closer than _____ feet to overhead, energized powerlines?

a. Eight feet
b. 10 feet
c. 12 feet
d. 20 feet

9. Under no circumstances may a chain saw be operated by a person who is working alone.

a. True
b. False

10. How often must chain saws be visually inspected?

a. At the start of each day's use
b. At the start of each day's use and again after lunch
c. Weekly
d. Monthly

11. Under the University of Minnesota policy, a student or employee who uses a chain saw for any reason must:

a. Complete a training program which complies with the University of Minnesota's chain saw, chipper, and brush cutter policy
b. Pass a medical evaluation
c. Pass a vision test to ensure he/she can properly inspect chain saw chain
d. Be able to climb a ladder while carrying a chain saw

12. Which of the following should be included as part of the pre-use inspection of a chain saw?

a. Chain brake
b. Chain tension, lubrication and sharpness
c. Guide bar wear and damage
d. Proper idling
e. All of the above

13. In felling trees, the role of a spotter is to guide the chain saw operator where to fell a tree.

a. True
b. False

14. ANSI-approved safety glasses are required for ALL work activities covered by this program.

a. True
b. False

15. While cutting with a chainsaw, the operator shall hold the saw with two hands, and both thumbs wrapped around the handles, except:

a. When cutting overhead
b. When working from a ladder or step stool
c. When bucking and limbing
d. None of the above, a chain saw must always be held in this manner while cutting

16. Which of the following is prohibited when starting the chain saw?

a. "Drop starting" chain saw
b. Having helper standing right next to employee starting chain saw

c. Not having the chain brake engaged
d. Putting on required PPE after chain saw is started
e. All of the above are prohibited

17. When cutting trees which are in a relatively horizontal position (i.e. laying on the ground), the operator's body should be positioned so that:

a. The saw is slightly offset to the right of the operator's body
b. The saw is directly in front of and centered on the operator's body
c. The saw is slightly offset to the left of the operator's body
d. Trees in a horizontal position rarely need to be cut

18. When trees are being felled, what is the minimum distance from the feller to adjacent occupied work areas and/or nearest person to the feller/trees being felled?

a. Six feet
b. Any distance deemed safe by the feller
c. Two tree lengths
d. No one should be within sight of the feller

19. Working alone when operating a chain saw is prohibited in all of the following scenarios, except:

a. Felling a tree
b. Clearing blowdown
c. Logging
d. Clearing isolated trees laying down across roads

20. Which of these statements is true concerning first aid kits at a worksite where chain saws are being used?

a. No first aid kit is required
b. First aid kits, with an adequate supply for the number workers present, is required at the jobsite.
c. There are minimum requirements for contents of first aid kits.
d. There must be at least one Emergency Medical Technician onsite
e. B and C

21. Which item would NOT violate the requirements for the chain saw operator's general attire:

a. Jeans
b. Necktie
c. Charm bracelet
d. Untucked and unbuttoned button-up shirt

22. What is the minimum level of foot protection required for <u>any</u> work covered by this program?

a. Sneakers/tennis shoes with open toes and heels
b. 6" high leather boot with slip-resistant sole.
c. Rubberized shoes/boots
d. 8" logger boots with Kevlar coating and composite toes

23. When walking with a chain saw, the bar should be pointed _____.

a. Forward
b. Backward
c. Up
d. Down

24. When felling a tree, at least ____ path(s) of escape should be planned and obstacles removed in the path(s). The path(s) should generally be _____ to the planned direction of the fall of the tree.

a. Two, Parallel
b. One, Opposite
c. Two, Away from the tree diagonal (45 degrees)
d. One, Parallel

25. PPE which is required by the employer must be provided to the employee _____.

a. At no cost to the employee
b. Prior to allowing the employee to perform work requiring PPE
c. In good condition, free of any defects
d. All of the above

ANSWER KEY:

1. e
2. b
3. a
4. a
5. d

6. d
7. a
8. b
9. b
10. a

11. a
12. e
13. b
14. a
15. d

16. e
17. c
18. c
19. d
20. e

21. a
22. b
23. b
24. c
25. d

APPENDIX D: TRAINING RESOURCES

The following resources may be used to assist in providing training pursuant to this program's requirements. However, they do not, by themselves, satisfy those requirements.

1. Minnesota Department of Labor and Minnesota OSHA online training videos:

   http://www.dli.mn.gov/Wsc/LogSafeVids.asp

2. Stihl online training videos:

   https://www.stihlusa.com/information/videos/chainsaw-safety-operation-maintenance/