DEVELOPED BY

EASTERN MAINE COMMUNITY COLLEGE
NORTHERN MAINE COMMUNITY COLLEGE
PROFESSIONAL LOGGING CONTRACTORS OF MAINE
WASHINGTON COUNTY COMMUNITY COLLEGE

Proposal for

Mechanical Forest Operator Training Program

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Purpose and Objective

This non-credit certificate program is designed to produce professional equipment operators with the knowledge and skills that are necessary in mechanical forest operations. In classroom and hands on settings, students will be taught machine operation and repair, maintenance of equipment, harvesting laws and regulations and safety. This program prepares graduates to work in commercial forestry operations as an equipment operator. The curriculum for this program has been designed with the assistance of HR managers, woodland owners, the Professional Logging Contractors of Maine, and current logging contractors in Northern, Central and Western Maine.

Suitability

A certificate of completion in Mechanical Forest Operation will provide employers much needed skilled operators for timber harvesting. According to the October 2012 report of the Logging Industry Advisory Group to the Joint Standing Committee on Labor, Commerce, Research and Economic Development, produced by the MDOL Bureau of Labor Standards:

"Demand for qualified, skilled forest industry labor is closely aligned to the demand for fiber at end using wood product mills, both in terms of volume and species. However, many other factors influence and often disrupt this relationship: Seasonality, availability of qualified skilled labor, wood inventory levels at mills, wood species availability, natural disasters, technology changes and finished product demand.

Over the past three decades, there have been concerted efforts to employ forest harvest practices that are environmentally friendly. Today's advanced harvesting technology and techniques have succeeded in being able to diminish the impact and "footprint" on sensitive forest ground conditions. However, these demands have also placed a heavier demand on forest landowners and contractors to hire operators with

more highly developed operator skills and forestry knowledge than was necessary two decades ago."

This training program will help solve the immediate need for trained, skilled entry level operators on today's very sophisticated harvesting equipment. It is a natural enhancement to some of the Maine Community College's existing programs in Diesel Hydraulics, Heavy Equipment and Commercial Driving.

Many of the targeted students have a basic background in mechanical and equipment operations and have been interested and previously exposed to a career in logging but lack the experience with the advanced components of the industry standard for harvesting equipment. Conversely, the employers have a pool of applicants who have already proven to be good employees as general laborers and other related trades and the employers are ready to invest in the employee for a more advanced and specific position.

By using simulated training in some of the most specialized areas to augment the hands-on field training, the issues associated by novice users on very technical and expensive equipment has been greatly reduced (cost, space, etc.) yet the training will provide a realistic experience with sophisticated controls. This simulation experience will increase the production and accuracy abilities for the participants and will decrease the risk of accidents and injury, both to personal and equipment related.

Through the generous support of our industry partners and the Maine Community College System across the State, this program has the opportunity to train at areas in Aroostook, Penobscot and Washington Counties, utilizing facilities that have volunteered their shops and equipment for hands-on training.

As proposed, the 12 week program will consist of 480 hours. Program participants and employers will be encouraged to continue with a formal on-the-job training plan utilizing

the MDOL apprenticeship program, as appropriate, to further refine the skills of these professionals.

Need_____

"Along with replacing the aging work force, absolute numbers of wood harvesting related jobs are constantly shifting. In the short term and to a higher degree in the long-term, forest harvesting training programs will have a difficult time achieving a sufficient flow of candidates who will match the demand for labor and satisfy forest industry requirement. However, many believe that the need to develop and institutionalize such a training program is pressing because there is currently no such program in the State of Maine or the Northeast to provide relief for these identified forestry industry labor issues." – Changing Demand for Woodworkers in the Maine Forest, MDOL BLS Report of the Logging Industry Advisory Group to the Joint Standing Committee on Labor, Commerce, Research and Economic Development October 2012.

This proposed program was requested by the area industry representatives who have played a very active role in shaping the curriculum over the past four years. The advisory group for this program was initially asked to work with the College to share concerns about logger and trucking training, both conventional and cut-to-length (mechanical), for some of the State's largest landowners. During this time, it became clear that the advisory group had immediate needs for advanced skills in equipment operators, technicians and other forest workers who are skilled in technologies and practices to improve energy efficiency and productivity. This need extends to both large and mid-size contractors across the State of Maine as they increase productivity and continue to invest in highly technical equipment to meet the ever changing industry standards for forest harvesting tools. The state wide development team consisted of industry champions representing all regions of the State. The team also included the Professional Logging Contractors of Maine, the Maine Department of Labor, and Northern Maine Development Commission. The intent of this training is to leverage established infrastructure in the three most heavily harvested regions of the State of

Maine by hosting the training at Eastern Maine Community College (EMCC) in Bangor, Washington County Community College (WCCC) in Calais and Northern Maine Community College in Presque Isle. Each of these campuses has established trade and technical programs that will further support the development of this new program in Mechanized Forest Operations and vast experience in workforce training utilizing advanced technologies and best practices. Direct industry involvement ensures that this program is relevant to specific industry needs and that the program graduates will be appropriately prepared for future employment in the forest harvesting industry.

Economic Impact_____

A published analysis of the economy of Aroostook County by Planning Decisions Inc. states that Aroostook County is unusually dependent on several sectors, including natural resources industries, transportation, healthcare/social services, and government. For the analysis, five existing and potential economic clusters were selected for review based upon their importance in the regional economy and their potential for job growth in the future. The clusters include three energy intensive process industries—forest products, agriculture, and precision manufacturing.

According to the 2013 Northeast Regional Woods Wage Survey "continues to reflect the changing nature of work in the woods industry. Fewer cable skidder operators were reported, indicating a move towards more updated mechanized logging operations that use larger and newer machinery. The move to machines means fewer logging companies are paying piece rate for their workers. Work in the logging industry is now primarily hourly and salary work."
From an occupational outlook perspective, this information is based on the 2012-2022 projections from the Center for Workforce Research and Information, Maine DOL:

Logging Equipment Operators (soc 45-4022) would include the mechanical harvesting operators; feller-buncher, delimber, skidder, harvester, forwarder, chipper etc. The

2012 statewide employment estimate was 1,859. About one-third of these workers are self-employed. By 2022 it is projected that the occupation will decline by 5.2% to employ approximately 1,759. Job openings will exist however to meet replacement demand for those who leave the occupation. About 28 openings are estimated per year during this projection period. For those workers performing hand-cutting (Fallers), the DOL has been unable to publish an estimate for several years due to this occupation being not reported in sufficient numbers by survey respondents.

Program Overview_____

The certificate in Mechanical Forest Operation is designed for students who desire to enter the workforce with less than one year of additional education beyond high school. It has been designed to also serve as a career development opportunity for incumbent workers. This certificate will give graduates a broad overview of the most common mechanical systems found in modern timber harvesting equipment and an understanding of the variables of timber growth, tree species, market flux and a strong emphasis on safety. Courses will be offered to students in a forest environment and in the classroom on a designated campus.

Some of the job opportunities from which graduates may gain employment, with survey support from the 2013 Northeast Regional Woods Wage Survey, include:

Mechanical Equipment Operators, including skidder operation; delimber operator; feller-buncher operator; logging equipment mechanic; forwarder operator; and processor operator; crane/hydraulic operator; laborer, general; logger all around

Curriculum_____

The curriculum for this 480 hour non-credit program is outlined below.

Completion of a four-year high school program or a state high school equivalency is required for admission into the Mechanical Forest Operators program.

There are opportunities to enroll individual students and employers in the apprenticeship program through the MDOL. These learning outcomes align with the schedule of work experience for basic training in Mechanical Harvester Operator (logging) SOC Code: 45-4022. Further hours of on-the-job training through an established apprenticeship program will allow maximum proficiency in each skill.

Learning Outcomes:

Following successful completion of this program, the participant will be able to:

• know, understand and describe harvesting law, environmental regulations and best practices pertaining to forestry, including, but not limited to: shoreland zoning, Maine Forest Practices Act, boundary lines, basal area, vernal pools, etc.
• comment on various aspects of general knowledge concerning the forest sector, including, but not limited to markets, utilization, equipment, logging techniques, etc.;
• demonstrate basic machine knowledge, skill and safety principles in the maintenance and repair of equipment;
• demonstrate the safe operation of a grapple skidder;
• demonstrate the safe operation of a feller buncher;
• demonstrate the safe operation of a mechanical delimber;
• demonstrate the safe operation of a cut to length processor;
• demonstrate the safe operation of a forwarder;
• demonstrate the safe operation of a crane;
• achieve industry recognized safety certifications (CLP Apprentice) by demonstrating competence in required safety standards for logging operations.
• demonstrate an understanding of ready to work principles, production based outcomes and basic logging economics;
• demonstrate a cooperative team vision approach in mechanical forest operations where three to five individuals must work together to accomplish the goal of producing forest products to roadside.

Content (syllabus)

- Introduction to the program
- First aid, safety and PPE
- Shop time, hand and power tools
- Basic maintenance and repairs
    1. Hydraulics
    2. Electronics
    3. Oil and fuel systems
    4. Service
    5. Tire chains and tracks
    6. Chain repair and sharpening
    7. Parts and operating manuals

- CLP forestry for mechanical operations
    1. Tree id
    2. Forest management and silviculture
    3. Fish and wildlife
    4. Map, compass and GPS technology
    5. Forester and landowner relations
    6. Fire suppression
    7. Product quality and markets

- Introduction to equipment maintenance and basic operations
    1. Equipment binder – operators manual
    2. Equipment functions
    3. Equipment specifications, including cost
    4. Equipment loading – dot regulations
    5. Equipment maintenance
    6. Simulators
    7. Initial equipment operation

- Harvesting at full production (hybrid)

12 week non-credit training in Mechanized Forestry Operations
(week by week descriptions)

Outline

Week 1

- Introduction of the program
  (release forms, review schedules, program summary, work rules, etc)
- Distribute all student manuals
- Review student's introduction materials
- Field tour to see the job site and view the equipment they will use when they are in full production.
- Complete an introduction to forest terminology (main boom, stick boom, controls, stub, sound wood, sweep, etc.)
- Basic Safety
- First aid for loggers
- OSHA
- Personal protective equipment
- Log out tag out
- Equipment compliance
- Basic shop hand and power tools
- Understanding the safe and correct operation of all necessary hand and power tools required in mechanized operations
- Introduction to basic maintenance and repair (shop and field)
- Fuel systems
- Oil systems
- Hydraulic Systems – hose repair
- Electrical systems
- Basic engine fuel, oil, air and cooling systems
- Servicing and preventative maintenance
- Introduction to the utilization of parts manuals
- Place students in operating teams

Week 2 *(Classroom)*
CLP Certification Program, topics include:

- CLP/Forestry
- Tree identification
- Hardwoods
- Softwoods
- Defects and forms
- Forest management and silviculture
- Basal area, forest management, forest practices act, boundaries and slash
- Conserving fish and wildlife
- Habitat; wildlife conservation considerations
- Map/compass and GPS for forestry
- Compass operation
- Map orientation
- Offsets
- Declination
- Map reading
- Introduction to GPS for Forestry
- Utilizing GPS technology for harvesting operations
- Introduction to forester/landowner relations
- Students will setup block for harvest using harvest prescription
- Yard set-up for various equipment configurations
- Clear-cut, shelterwood, and overstory harvesting techniques
- Forest fire suppression
- Safety
- Personal protective equipment
- Containment
- Chain of command
- Firefighting equipment
- Introduction to Product Quality and Markets
- Markets
- Log specification
- Log utilization
- Damage caused by mechanical equipment

WEEKS 3-6

Introduction to Equipment Operation and Maintenance

Cover basic/routine repairs and maintenance such as:

- Remove and replace front bar & chain on the delimber and processor
- Delimber knife sharpening and adjustment
- Remove and replace a hose and tighten chains/tracks on the grapple and forwarder
- Remove and replace a tooth with torch wrench on the buncher
- Equipment operation demonstrations
- Separation of Operations
- Review equipment safety protocol
- Introduction to simulators. Simulator operation is required daily prior to operation.
- Allow students to begin to operate equipment
- Cover the details of weekly safety meetings
- During this initial introduction to forest operations, the following items are discussed:
- Equipment binders (operators manual, lockout/tagout, maps, -see blue book)
- Equipment operation functions
- Introduction to equipment communications and chain of command
- Equipment operation (hands-on, explanation and discussion)
- Perform an oil change
- Perform air filter change
- Show students where all other oil and filter components are located
- Show students where all grease fittings are located
- Show controls and pre-heater setup
- Conduct demonstrations on the equipment; students will practice following equipment training guidelines listed below. (example -working the functions, picking up trees harvested by instructor with the saw turned off, etc.)

Delimber: (will vary depending on operators' capabilities)

- Daily maintenance schedule
- Learn the functions of the machine without handling trees
- Grab the trees only and drop (repeat until student becomes comfortable)
- Begin limbing with a pole using both grab arms and repeat by dropping the same tree
- Instructor demonstrates by limbing a few trees, having the student watch from a safe distance

- Allow student to begin limbing wood in a pile at the yard, stressing that piles are even and sorted correctly
- Allow student to begin limbing with the grapple feeding the delimber
- Review best management practices and employ in operation

Grapple: (will vary depending on operators' capabilities)

- Daily maintenance schedule
- Learn the functions of the machine
- Allow student to operate grapple in a trail or road
- Begin to have student push/pull and slide to left and right with an 8' log in the yard.
- Allow student to practice grabbing a tree grapple or use a stump as a target
- Instructor demonstrates how to grab a bunch and bring it to the delimber, once the demonstration is done, allow students to practice grabbing a bunch.
- Begin to have the student haul to the delimber
- Review best management practices and employ in operation.

Buncher: (will vary depending on operators' capabilities)

- Daily maintenance schedule
- Learn the machine functions
- Have student practice picking up a tree, swing and drop, pick it up again and drop in another location (repeat until student begins to become comfortable)
- Have student start picking up 3-4 different size trees and make level piles
- Have the student practice keeping the cutting head level and moving over a stump to practice grabbing a tree.
  Note (operator does not start cutting until all functions are performed smoothly)
- The instructor will demonstrate by cutting a few trees with the student behind the seat. As the student begins to operate, have them cut only one tree at a time and pile during the first week in the machine.
- Have the student practice cutting and accumulating trees during their second week of operation.
- Review best management practices and employ in operation.

Processor (CTL): (will vary depending on operators' capabilities)

- Daily maintenance schedule
- Learn the machine functions
- Have student practice picking up a tree, swing and drop, pick it up again and drop in another location (repeat until student begins to become comfortable)
- Have student start picking up 3-4 different size trees and make level piles Have the student practice keeping the cutting head level and moving over a stump to practice grabbing a tree.
- The instructor will demonstrate by cutting a few trees with the student behind the seat. As the student begins to operate, have them cut only one tree at a time and pile during the first week in the machine.
- Have the student practice cutting and accumulating trees during their second week of operation.
- Review best management practices and employ in operation.

Forwarder: (will vary depending on operators' capabilities)

- Daily maintenance schedule
- Learn the functions of the machine without handling trees
- Grab the trees only and drop (repeat until student becomes comfortable)
- Grab trees and load bunks
- The instructor will demonstrate loading in place and off loading according to proper sorts.
- Allow student to begin loading wood from a pile at the yard and then off loading according to proper sorts, stressing that piles are even and sorted correctly.
- The instructor will demonstrate loading in the woods and moving the forwarder safely through the woods.
- Allow student to begin loading in the woods and off loading at a landing.
- Review best management practices and employ in operation.

Weeks 7 - 12

Harvesting at Full Production (Hybrid: Classroom and Production)

- Simulators are used pre-operation each day.
- Teamwork and Communications are covered in the classroom and reinforced on the job site.
- Review of logging economics and the business of logging in the classroom.
- Review of production based outcomes in the classroom.

- Video analysis of jobsite and equipment operations in the classroom.
- Introduction and review of sorting, markets and log specifications.
- Review of safety and maintenance schedules.
- Review of best management practices in the field.
- Instructor evaluation of students begins.
- Each student should operate each individual machine for a whole week
- Instructor(s) must ensure that the buncher operator and processor operator clearly understand the operating procedures before harvesting begins
- 1st week of operation will be cutting shelter wood w/ trail system
- 2nd week -basal area reduction harvest w/ trail system
- Instructor must demonstrate harvesting techniques that maximize production but reduce overall operating cost.

Proposed Delivery Plan:

- **Year 1** (12 students, total)
- **Year 2** (24 students, total)
- **Year 3** (36 students, total)

Each session will be 12 weeks of instruction, with a 2 week window to move equipment before and after the course.

Equipment: Equipment for the program will be located at host site during training and rotated to other training sites as needed. The administrative campus will arrange equipment transportation and logistical support for equipment and supplies. Equipment and supplies will be stored at the administrative campus when not in use for training. Each host site can provide adequate classroom and laboratory facilities, as well as an area to perform basic maintenance of equipment during the training sessions. Host sites will provide secure locations for equipment and will help coordinate the off-site training locations (cutting sites), assist with screening of potential students and on-site support for the coordination and instruction of the program. The administrative campus will hire personnel, purchase equipment/supplies and equipment repairs, provide insurances/credentialing/licensing as needed, and coordinate with the host campuses to provide quality education to the students.