Board/Authority Authorised Course Construction and Forestry Certification

School District/Independent School Authority Name	Kamloops/Thompson
School District/Independent School Authority Number	#73
Developed by	Carl Smith
Date Developed	December 2013
School Name	NorKam Secondary School
Principal's Name (District)	Sheryl Lindquist
Superintendent Approval Date (for School Districts only)	
Superintendent Signature (for School Districts only)	
Board/Authority Approval Date	
Board/Authority Chair Signature	
Course Name	Construction and Forestry Certification
Grade Level of Course	11 and 12
Number of Course Credits	4
Number of Hours of Instruction	120
Prerequisite(s)	None

Synopsis

This course is one of four certification courses developed to give the student the opportunity to gain the knowledge and experience needed to work in the construction and forest industry as an entry level

employee. The course provides an insight into the jobs available in these industries. The course gives the student an awareness of the safety required on the job site.

Rationale

Why is it important the student take this course?

- Upon completion of this course the student will have an understanding and awareness of what is involved in working in the construction or forestry industry.
- The student will have gained sufficient safety knowledge to protect not only the student as a new employee on the job site but also fellow employees.
- The student will display specific work site attitudes and skills that an employer in either the mining or oil industry will find to be an asset and not a liability to their company. These attitudes and skills should give the student a head start over other job seekers within these industries.
- The student will have attained certification in Construction Safety Training Systems (CSTS) and fall restraints.

Unit/Topic	Title	Time
Unit 1	Construction and Forestry Review	10 hours
Unit 2	Construction Safety Training System (CSTS) Certification	10 hours
Unit 3	Mapping, blueprints, survey, and layout skills	15 hours
Unit 4	On the job tool training and safety	40 hours
Unit 5	Working at height and fall restraint certification	15 hours
Unit 6	Excavation, back fill, shoring, and ground disturbance	20 hours
Unit 7	Concrete work, form work	10 hours
	Total Hours	120

Unit 1 – Construction and Forestry Overview

Objective: This unit provides the student with an overview of the different types of jobs available in the construction and forestry industry.

Prescribed Learning Outcomes

Students will learn:

- The types of jobs available in the respective industries.
- The type of skills required in the various jobs.

- The training required in learning the necessary skills.
- The differences in residential, commercial or forestry jobs.
- The kinds of environments in which the student would be working.

Unit 2 – Construction Safety Training System (CSTS) Certification

Objective: This unit is a web-based program designed to provide a solid base of knowledge about workplace safety. The student will progress through the modules as required and test their knowledge of content through interactive question and answer scenarios.

Prescribed Learning Outcomes

Students will learn:

- The importance of safe work practices.
- The ability to recognize potential construction or forestry workplace hazards.
- To identify and apply preventative actions to control or eliminate hazards
- To develop safe work procedures and explain how to work safely in areas exposed to hazards.
- To understand basic hazard awareness and protection as it relates to WorkSafeBC regulations and standards.

A recognized industry certificate will be given upon successful completion of this unit.

Unit 3 – Mapping, Blueprints, Survey, and Layout Skills

Objective: This unit develops the student's ability to read and understand basic drawing styles that are used within the construction and forestry industry. It is important that the student be able to interpret what is in a drawing to the actual job at hand and then use that knowledge to layout work or site lines etc. Also important is the skill of basic survey. The course is designed to give the student the basic abilities to read maps and be aware of what survey tools do.

Prescribed Learning Outcomes

Students will learn:

- To identify various types of construction drawings.
- To interpret elements of drawings and common abbreviations and acronyms.
- To interpret symbols and drawing information.
- To read and understand the basic elements of a drawing.

Within this unit the student will also be introduced to:

- Plans and drawings.
- Differential levelling methods.
- Distance and angular measurement.
- Slope and grade staking.
- Use of hand levels and lasers.

- Transits and theodolites.
- GPS.

Unit 4 – On the Job Tool Training and Safety.

Objective: This unit examines various safety concerns specific to the construction and forestry industry. The student will be working in an environment that requires many different safety skills. The tools used in these industries vary greatly and each requires a specific safety awareness. This unit will give the student experience in using a wide variety of tools safely and correctly.

Prescribed Learning Outcomes

The student will work with and develop correct procedures with the following:

- Hand and portable tools, i.e., hand saws, circular saws, drills, etc.
- Portable pneumatic tools, i.e., air nailers, staplers, etc.
- Portable stationary tools, i.e., table saws, planers, jointers, etc.
- Power actuated tools – must receive validation card.
- Trailerable compressors, pumps, hoists, cement mixers, etc.
- Soil tampers, pneumatic jack hammers and drills.
- Portable piston driven tools – chainsaws, diamond saws.

Unit 5 – Working at Height and Using Fall Protection and Restraints Certification

Objective: This unit draws the student's attention to the dangers of working at heights. It is meant to develop safety awareness when using ladders of various types and scaffolds. The student will learn to use fall protection and restraints in the correct manner. The student will learn to understand equipment specifications, limitations, proper care and inspection of said equipment and preparedness for the job site:

Prescribed Learning Outcomes

- Learn how to correctly use step, extension ladders (4 to 1 rule), platform ladders, etc.
- Learn to assess the hazards and to determine the safest method of setting up ladders.
- Learn to correctly set up tubular scaffolding within WorkSafeBC Regulations, recognize the capacities and limitations of specific styles of scaffolding.
- Learn how to install, wear, and use fall protection correctly as per regulations.
- Learn how to deal with an emergency situation if a fall occurs.

Upon completion of this unit, the student will receive an industry recognized certificate.

Unit 6 – Excavation, Backfill, Shoring, and Ground Disturbance

Objective: This unit prepares the student to work on a job site that is undergoing ground preparation work. This unit will also include an 8.5 hour ground disturbance program designed to make employees aware of the potential risks involved with digging below ground (or disturbing) soil, gravel, etc.

Prescribed Learning Outcomes

The student will learn:

- To work safely around earth moving equipment of various sizes.
- To recognize the dangers of working in confined trenches in various soils and how to use proper shoring techniques to be protected.
- To follow WorkSafeBC regulations and guide lines when shoring up said trenches.
- To backfill and how to follow proper compaction procedures.
- To understand the dangers of working around concrete forms and rebar, and working above non-backfilled form- filled trenches and take necessary precautions to be protected from said dangers.

In the Ground disturbance section the student will learn:

- To recognize the serious dangers posed by unmarked infrastructure.
- The necessary steps to minimize risk.
- The process of pre-planning the work right through to the actual dig - both the mandatory and recommended practices.

Unit 7 - Concrete Work and Form Work

Objective: This unit instructs the student in the correct methods of forming and placing of concrete. It also explains methods of concrete mixing and the various types of concrete that are used in industry. The unit also shows the importance of using the correct types of form ties, proper use of rebar, and the proper consistency of concrete. It also requires the student to be aware of industry standard for the strength of cured concrete and how that is achieved.

Prescribed Learning Outcomes

The student will learn:

- To build forms correctly and to industry standards and required building codes using rebar as required.
- How to calculate the volume of concrete required and how to order the correct amount to complete the job.
- To handle concrete in a safe and timely fashion.
- To place and tamp/vibrate concrete as required and correctly.
- How to finish and cure concrete.
- To remove forms safely and efficiently without damage or injury.
- How to maintain and repair concrete.

Instructional Component

- Direct instruction including individual and class instruction
- Independent instruction- self-directed
- Experiential learning
- Group and peer learning

- Computer-based learning
- Modeling
- Project work

Assessment Component

- Journals and logbooks by student
- Self-evaluation
    - Formative assessment
    - Summative assessment
- Observation by instructor
    - Anecdotal
    - Checklists
- Employability checklist
- Completed written and practical assignments
- Written quizzes – daily, unit, semester finals, course final
- Certificate specific exams

To pass the course the student must attain a minimum of 50% overall. The course involves both theory and practical work. The weighting of each will vary within the unit of study.

To qualify for the individual certificates in the units, the student must pass by the minimum required by the issuing body. This may vary from a minimum of 70% to a maximum of 100%.

Upon completion of the course, the student that has demonstrated a full understanding, a good attitude, and has attained all the necessary certification will receive a recommendation based upon his work done, plus the appropriate letter grade.

Learning Resource

- Industry supplied manuals and information packages
- Thompson Rivers University course-specific information
- Web- based programs specific to the unit subjects
- WorkSafeBC BC
- Instructor- supplied materials
- Guest instructors and speakers from industry and the community
- Industry job site visits

Recommended Resources

- Industry Training Authority (ITA) www.itabc.ca
- BC Construction Industry Training Organization www.bccito.com
- WorkSafeBC (WCB) http://www.worksafebc.com
- British Columbia crown publications http://www.crownpub.bc.ca/

- Cement Association of Canada http://www.cement.ca/
- Progressive educational systems http://www.simlog.com/simlognews/progressive-canada-2013-11-07.html
- BC Construction Safety Alliance https://www.bccsa.ca/
- Southern Interior Construction Association https://www.sica.bc.ca/page/calendar/ezlist_events_f=85061804-76fe-44b2-ac59-6ddf1062a5bc.aspx

Facility Requirements

Classroom Area

- Minimum 30 square feet per student.
- Comfortable seating and tables suitable for learning.
- Compliance with the Local and National Fire Code and occupational safety requirements.
- Meets applicable municipal zoning bylaws for technical instruction and education facilities.
- Overhead and multimedia projectors with a projection screen and associated computer equipment.
- Whiteboard with marking pens and erasers.
- Lighting controls to allow easy visibility of the projection screen while allowing students to take notes.
- Windows must have shades or blinds to adjust sunlight.
- Heating/air conditioning for comfort all year round.
- Acoustics in the room must allow audibility of the instructor.

Shop Area

- Minimum 2400 square feet of shop area including a tool crib and work stations.
- Minimum 15’ 6” ceiling height in shop areas.
- Adequate heating, lighting, and ventilation.
- Acoustics in the room must allow audibility of the instructor.
- Refuse and recycling bins for used shop materials.
- First-aid equipment.

Lab Requirements

- Minimum 2400 square feet in lab.
- Minimum 15’ 6” ceiling in lab areas.
- Adequate heating, lighting and ventilation.
- Acoustics in the room must allow audibility of the instructor.
- Refuse and recycling bins for used lab material.

Student Facilities

- Adequate eating area as per WorkSafeBC requirements (4.84 OHS Regulation and Guidelines)
- Adequate washroom facilities as per WorkSafeBC requirements (4.85 OHS Regulation and Guidelines)
- Minimum 10 cu. ft. personal storage lockers

Instructor's Office Space

- Adequate office space for student consultation
- Desk and filing space
- Computer
- Internet access
- Printer access
- Adequate storage facilities for material and training aids
- Access to photocopier/scanner
- Telephone

Equipment

- 20 + 1 instructor computer stations c/w voice and sound capabilities with ear phones.
- PPE for 20 students.
- Carpentry tools – hand tools and portable tools, pneumatic tools.
- Excavation tools – shovels, rakes, picks, tampers, wheel barrow.
- Concrete tools – trowels, floats, cement mixer, etc.
- Safety harnesses and fall protection gear.
- Survey tools – transits, GPS, laser levels, etc.
- Chainsaws and appropriate safety gear include gas and oil cans, etc.
- Rigging apparatus, etc.
- Various ladders.
- Scaffolding.
- Mechanical tools – wrenches, pliers, screwdrivers, etc.
- Assorted tool cabinets.