



Board/Authority Authorised Course Mechanical Trades Sampler - Heavy Duty/Commercial Transport Technician

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| School District/Independent School Authority Name | Kamloops/Thompson |
| School District/Independent School Authority Number | #73 |
| Developed by | Allen Kotani |
| 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 | Mechanical Trades Sampler – Heavy Duty/Commercial Transport Technician |
| Grade Level of Course | 12 |
| Number of Course Credits | 4 |
| Number of Hours of Instruction | 120 |
| Prerequisite(s) | Completion of Grade 10 as well as successful application process. |

Synopsis

This course has been developed to offer students the opportunity to gain theoretical and practical experience, examining four different mechanical trades. This mechanical sampler and initiative, set



forth by The Ministry of Jobs, Tourism, and Skills Training, Ministry of Education, School District #73, and Thompson Rivers University (TRU) will explore four career paths; Automotive Service Technician, Heavy Duty Technician-Commercial Transport Technician, Motorcycle Technician, and Welding Trade. The Industry Training Authority (ITA) and Ministry of Education Instructional Resource Package have been used as guidelines for the content covered within this sampler.

Rationale

This course is intended to introduce students to specific trades training in the area of Heavy Duty-Commercial Transport Technician (HD/CT). This will provide students with an overview of the Foundations (HD/CT) Program.

This program will explore;

- Introduction of safe work practices employed in a Mechanical/Instructional facility
- Overview of the practices, skill sets needed for the Mechanical Trade
- Theory and practical applications within Mechanical Trades
- Direct exposure to Foundation Training content, Post-Secondary and job ready expectations. Therefore, providing students with the ability to make informed choices regarding the direction they choose to embark during Senior Secondary School and/or thereafter.

| Unit/Topic | Title | Time |
|------------|---------------------------|----------|
| Unit 1 | Safety | 10 hours |
| Unit 2 | Fasteners/Tools/Equipment | 10 hours |
| Unit 3 | Rigging/Hoisting/Holding | 10 hours |
| Unit 4 | Brakes | 20 hours |
| Unit 5 | Steering/Suspension/Align | 20 hours |
| Unit 6 | Engine Management | 20 hours |
| Unit 7 | Support Systems | 30 hours |
| | Total Hours | 120 |

Unit 1 - Safety

Objective: Safe worksite practices are of the utmost importance. Students need to be aware of safety-oriented rules and regulations, and be able to perform all industry tasks in a safe and responsible manner.



Prescribed Learning Outcomes

Students will acquire skills related to identification and use of:

- WCB Regulation
- WorkSafeBC
- Workplace Hazardous Materials Information System (WHMIS)
- Fire Safety and Prevention
- Hoisting, jacking, supporting, slinging
- Personal Safety

Unit 2 – Fasteners/Tools/Equipment

Objective: Trades and technology fields have a very strong practical component. Tools are used regularly and must be used properly, from basic hand tools to precision-measuring instruments.

Prescribed Learning Outcomes

Students will acquire skills related to identification and use of:

1. Fasteners
 - Types of fasteners.
2. Tools
 - Hand
 - Electric
 - Portable power
 - Pneumatic
 - Hydraulic
 - Precision-measuring mathematical calculations
 - Engine management
3. Equipment
 - Lifting
 - Supporting
 - Slinging
 - Cutting/welding
 - Air conditioning

Unit 3 – Rigging/Hoisting/Holding

Prescribed Learning Outcomes

Students will acquire skills related to identification and use of:

- Ropes, chains, slings
- Hoisting equipment



Unit 4 – Brakes

Prescribed Learning Outcomes

Students will acquire skills related to identification and use of:

1. Hydraulic Systems
2. Disc Brake Systems
3. Drum Brake Systems
4. Air Braking Systems

Unit 5 – Steering/Suspension-Frame/Alignment

Prescribed Learning Outcomes

Students will acquire skills related to identification and use of:

1. Steering
 - Steering gears
 - Steering linkage
 - Steering components
2. Suspension
 - Suspension geometry
 - Suspension components
 - Suspension systems
 - Frame functions, design, construction
3. Wheel Alignment
 - Alignment angles
 - Alignment adjustment

Unit 6 – Engine Management

Prescribed Learning Outcomes

Students will acquire skills related to identification and use of:

1. Diesel Injection
 - Theory of operation
 - Technical service information
 - Test equipment
2. Combustion Process Starting Aids
 - Theory of operation
 - Technical service information
 - Test equipment
 - Direct injection



- Indirect injection
- Preheating devices

Unit 7 – Support Systems

Prescribed Learning Outcomes

Students will acquire skills related to identification and use of:

1. Charging/Starting Systems
 - 12 volt batteries
 - Charging systems
 - Starting systems
2. Cooling Systems
 - Principles of heat transfer
 - Cooling systems
 - Cooling system components
3. Lubrication Systems
 - Lubrication systems
 - Lubrication system components
4. Turbo-charged Air Systems
 - Turbo-charged systems
5. Air Induction and Exhaust Systems
 - Air induction systems
 - Exhaust system
6. Electrical
 - Principles of electronics
 - Common electrical and electronic components
 - Electrical diagrams
 - Multimeters/test equipment

Instructional Component

- Direct instruction
- Indirect instruction
- Interactive (peer) instruction
- Independent instruction
- Modeling
- Practical creativity
- Brainstorming
- Group work
- Analysis of own and classmates' project work
- Project-based learning



Assessment Component

- Daily quizzes
- Unit quizzes
- Demonstration of skills related to practical activities

Eighty per cent (80%) of the grade will be based on safety tests and project evaluations throughout the course. This portion of the grade will reflect the students' most consistent level of achievement throughout the course, although special consideration will be given to the more recent evidence of achievement.

Twenty per cent (20%) of the grade will be based on student research, documentation, reflection, and demonstration of proper employability skills (proper industrial work habits ranging from the safe use of equipment to good "Housekeeping" techniques).

Learning Resource

- Teacher handouts
- Guest speakers from the community in related fields
- Visit/interview local trades people in related fields
- ILMs

Facility Requirements

Classroom Area

- Comfortable seating and tables for training, teaching, lecturing.
- Compliance with all Local and National Fire Code and occupational safety requirements.
- Lighting controls to allow easy visibility of projection screen allowing students to take notes.
- Windows must have shades or blinds to adjust sunlight.
- Heating/air conditioning for comfort all year round.
- In-room temperature regulation and ventilation to ensure comfortable room temperature.
- Acoustics in the room must allow the instructor to be heard.
- White marking board with pens and eraser (optional: flipchart in similar size).
- Projection screen or projection area at front of classroom.
- Overhead projector and/or multimedia projector.

Shop Area

- Ceiling shall be a minimum height of 15' 6" or as varied by good engineering practices and codes.
- Appropriate lifting cranes as required to move industry equipment.
- Suitable demonstration area.
- Lighting appropriate for good vision in ambient light.
- Compliance with all Local and National Fire Code and occupational safety requirements.



- Must meet Municipal and Provincial bylaws in regard to waste water management and environmental laws.
- Approved ventilation systems.

Reference Materials

Alberta Apprenticeship Resource Package, Crown Publications

Lifting It Right, Automotive Lift Institute (ALI)

Industry Training Authority (ITA), www.itabc.ca

Ministry of Education, Instructional Resource Package (IRP), www.bced.gov.bc.ca

WorkSafeBC, workers' Compensation Board of BC (WCB), www.worksafebc.com

Workplace Hazardous Materials Information System (WHMIS), www.hc-sc.gc.ca

CDX Automotive, Jones & Bartlett Learning, www.cdxauto.com