

PROGRAM GUIDE

Youth Explore Trades Sampler

August 2022





PREFACE

The latest version of this document is available in PDF format on the ITA website at:
www.itabc.ca

To order printed copies of Program Outlines or learning resources (where available) for BC trades, contact:

Crown Publications, Queen's Printer

www.crownpub.bc.ca
crownpub@gov.bc.ca

Toll Free: **1 800 663-6105**

Copyright © 2022 Industry Training Authority

This publication may not be modified in any way without permission of the Industry Training Authority



FOREWORD

Youth Explore Trades Sampler is a 10- to 12-week, or 300-hour, program that provides participants with an in-depth opportunity to explore four or more trades. Historically, similar programs have received funding through the Ministry of Advanced Education through one-time funding on a year-to-year basis. ITA's funding will be ongoing as part of our core Youth programs.

During the ITA Youth Refresh Consultation, participants recommended that ITA fund the Youth Explore Trades Sampler, suggesting that this would reduce the numbers of youth using the Youth Train in Trades program to explore the trades, and that it would improve Apprenticeship continuation rates.

The Youth Explore Trades Sampler is meant to be a higher level program than Youth Explore Trades Skills, which is the high school version. Ideally, students would take the Youth Explore Trades Skills first to identify potential interest in a trades career path. The more in-depth and comprehensive 300-hour Youth Explore Trades Sampler program gives students a chance to explore trades further before committing to a dedicated trade program such as Youth Work in Trades or Youth Train in Trades.

Starting in September 2016, ITA will fund Youth Explore Trades Sampler for secondary school-aged students and incorporate those students into the ITA Youth Trade Programs.

Purpose of this Guide

The Youth Explore Trades Sampler Guide is designed to provide post-secondary institutions and school districts or independent school authorities working together to deliver the Youth Explore Trades Sampler with the information they need, including:

- An Introduction to Youth Explore Trades Sampler
- A description of the delivery model
- How to access funding for Explore Trades Samplers
- How to register and report on student outcomes
- Learning outcomes for common trades offered through Youth Explore Trades Samplers



ACKNOWLEDGEMENTS

The Program Guide is based on the original work done by Camosun College:

- Brian Coey – Camosun College
- Christian Allen – Camosun College

Industry subject matter experts retained to assist in the development of the Program Guide content:

- Barry Felardeau – British Columbia Institute of Technology
- Corwin Siemens – Northwest Community College
- Gary Henderson – British Columbia Institute of Technology
- Jane Worton – Queenswood Consulting
- Julie-Claire Hamilton – Selkirk College
- Olaf Nielsen – Camosun College
- Rick Hall – Northern Lights College
- Robert Kunka – Vancouver Community College
- Tamara Pongracz – British Columbia Institute of Technology
- Waylon Roy – Northwest Community College

Facilitators:

- Claudine Warburton – Industry Training Authority
- Jason Leber – Industry Training Authority

The Industry Training Authority would like to acknowledge the dedication and hard work of all of the industry representatives appointed to identify the training requirements of the Youth Explore Trades Sampler.



Table of Contents

PART ONE: YOUTH EXPLORE TRADES SAMPLER OVERVIEW	1
Program Length	1
PART TWO: REGISTERING STUDENTS	3
School Districts – School-Aged Students	3
Post-Secondary Institutions – Adult Students	3
PART THREE: REPORTING STUDENT RESULTS	4
PART FOUR: YOUTH EXPLORE TRADES SAMPLER FUNDING OVERVIEW.....	5
PART FIVE: DELIVERING A YOUTH EXPLORE TRADES SAMPLER PROGRAM	6
PART SIX: EXAMPLES OF YOUTH EXPLORE TRADES SAMPLER PROGRAM MODELS.....	9
PROGRAM GUIDE	13
LINE A: ESSENTIAL SKILLS	14
Competency A1: Use Communication Skills	15
Competency A2: Use Numeracy Skills	16
Competency A3: Apply Study Skills.....	17
Competency A4: Work With Others.....	18
Competency A5: Read and Interpret Drawings	19
LINE B: USE SAFE WORK PRACTICES	20
Competency B1: Control Workplace Hazards	21
Competency B2: Use OH/S Regulation and WorkSafeBC Standards.....	23
Competency B3: Use Personal Protective Equipment.....	25
Competency B4: Apply Fire Prevention	26
LINE C: WORKFORCE CERTIFICATES	27
Competency C1: Use WHMIS	28
Competency C2: Use First Aid	29
Competency C3: Select a course from the list of certificates.....	30
LINE D: EMPLOYABILITY/EMPLOYMENT ENGAGEMENT	31
Competency D1: Describe Apprenticeship System	32
Competency D2: Attend a Guest Speaker Event.....	33
Competency D3: Describe Employer Expectations	34
Competency D4: Attend a Work Site Visit	35
Competency D5: Work Experience.....	36
LINE E: USE TOOLS AND EQUIPMENT	37
Competency E1: Use Common Hand Tools.....	38
Competency E2: Use Common Portable Power Tools	39
LINE F: SHEET METAL MODULE	40
Competency F1: Describe the Sheet Metal Trade and Associated Careers.....	41



LINE G: PIPE TRADES MODULE	45
Competency G1: Describe the Pipe Trades and Associated Careers	46
Competency G2: Use Safe Work Practices in the Pipe Trades	47
Competency G3: Use Pipe Trade Tools and Equipment.....	48
Competency G4: Construct Piping Systems.....	50
LINE H: WELDING MODULE	51
Competency H1: Describe the Welding Trade and Associated Careers	52
LINE I: METAL FABRICATION MODULE	57
Competency I1: Describe the Metal Fabrication Trade and Associated Careers	58
Competency I2: Use Safe Work Practices in a Metal Fabrication Shop	59
Competency I3: Use Metal Fabrication Tools and Equipment.....	61
Competency I4: Complete Metal Fabrication Projects.....	62
LINE J: CARPENTRY MODULE	63
Competency J1: Describe the carpentry trade and associated careers.....	64
LINE K: ELECTRICAL MODULE	67
Competency K1: Describe the Electrical Trade	68
LINE L: AUTOMOTIVE SERVICE	77
Competency L1: Describe the Automotive Industry and Associated Careers.....	78
LINE M: HEAVY DUTY EQUIPMENT TECHNICIAN MODULE	82
Competency M1: Describe the Heavy Duty Equipment Industry	83
Competency M2: Use Safe Work Practices in a Heavy Duty Equipment Shop.....	84
Competency M3: Use Heavy Duty Tools and Equipment.....	86
Competency M4: Complete Projects	87
LINE N: MILLWRIGHT MODULE	88
Competency N1: Describe the Millwright Trade and Associated Careers	89
LINE O: MACHINIST MODULE	92
Competency O1: Describe the Machinist Trade and Associated Careers	93
Competency O2: Use Safe Work Practices in a Machine Shop.....	94
Competency O3: Use Machinist Tools and Equipment	96
Competency O4: Complete Machinist Projects	98
APPENDIX A: TRADES SAMPLER COURSE CODES	99
APPENDIX B: YOUTH EXPLORE TRADES SAMPLER INTAKE FORM – FOR ADULTS	101
APPENDIX C: SAMPLE MARKS FORM	103



PART ONE: YOUTH EXPLORE TRADES SAMPLER OVERVIEW

Program Length

The Youth Explore Trades Sampler is typically a 10- to 12-week, 300-hour program that provides participants with an in-depth opportunity to explore four or more trades. Training providers and school districts have the flexibility to offer the program full-time, or part-time over a longer period.

Typical Program Design

2 to 4 weeks	<p>Workplace skills training</p> <ul style="list-style-type: none"> ▪ Safety, including at least three workforce certificates. It is recommended that two of these are WHMIS and Occupational First Aid Level 1, with the third certificate to be determined by the program, based on local conditions. ▪ Tools and Equipment ▪ Job Readiness Skills ▪ Overview of Apprenticeship ▪ Bullying and Harassment
8 to 10 weeks	<p>Technical modules</p> <ul style="list-style-type: none"> ▪ Covering four or more trades. Programs can choose which trades to offer, based on local conditions. ▪ Each trade module ideally includes contact with one employer in the relevant trade, either in the classroom or on a work site. ▪ During the Explore Trades Sampler program overall, there should be at least one visit to a work site.
4 weeks	<p>Work Experience *OPTIONAL</p> <ul style="list-style-type: none"> ▪ Youth participants in the program should also complete a 120-hour Work Experience program. This Work Experience placement is organized through the school district, and credited separately as WEX 12A or 12B. School district liability coverage covers the student while they are in WEX.



Youth Explore Trades Sampler Program Delivery Responsibilities

- Deliver a program aligned with the Youth Explore Trades Sampler model, including workplace skills, technical training in four or more trades, and provide trades training continuation supports.
- Register adult students with ITA within the first 15 days of the start of classes.
- Submit a Marks form to the school district within 15 days of the completion of the program.
- Public post-secondary institutions must report on Youth Explore Trades Sampler programs on their Reconciliation Reports. Private post-secondary institutions must submit an invoice to ITA one week after the start of the course, including the numbers of students registered.
- Post-secondary institutions issue a transcript that indicates the student's mark for the program to each student who completes the program.
- All program providers will participate in any evaluation of Youth Explore Trades Sampler to determine if program outcomes are being met, and to determine if funding for the program should be continued.



PART TWO: REGISTERING STUDENTS

School Districts – School-Aged Students

Registering with the Ministry of Education and Child Care (ECC)

- Youth Explore Trades Sampler reporting for funding is in accordance with related Form 1701 Instructions and the Recognition of Post-Secondary Transition Programs for Funding Purposes Policy.
- Youth Explore Trades Sampler is eligible for three course credits: TST* 12A, TST* 12B, and TST* 12C. "*" is the post-secondary Institution letter identifier. **See Appendix A** for a complete list of Youth Explore Trades Sampler course codes by post-secondary institution (PSI).
- ITA recommends that all youth participants also undertake a 120-hour work placement, which would be registered as a separate Ministry-Authorized Work Experience course. This is to be organized by the school district.
- Trades Sampler programs with more than three courses (excluding WEX) may use a PSI code for the additional course(s). However, ITA provides no additional funding for a longer program.
- As a career program, the Youth Explore Trades Sampler may be reported as a Career Technical Centre activity.

Registering with ITA

- One week after the start of the program, when student registration is confirmed, school districts or independent school authorities must register school-aged students with ITA through the Dual Credit Management System (DCMS). If you need assistance with DCMS, please contact youth@itabc.ca.

Post-Secondary Institutions – Adult Students

Post-secondary institutions are responsible for registering adults in the Youth Explore Trades Sampler with ITA:

- Post-secondary institutions will be expected to submit a Youth Explore Trades Sampler Intake Form, listing all adult students' names and Individual IDs to youth@itabc.ca. **See Appendix B** for the Youth Explore Trades Sampler Intake Form.
- Post-secondary institutions will direct adult students to create an ITA Individual ID. A video guiding the creation of an account is at <http://www.itabc.ca/registration-checklist/how-guides#Create>, and links and instructions can be found at http://204.83.165.77/PosseHelp/NewAccountHelp_ext.htm.

NOTE: Adult students are responsible for paying the full tuition fee. There is no ITA subsidy or Ministry of Education and Child Care (ECC) funding eligibility for adult students.



PART THREE: REPORTING STUDENT RESULTS

ITA does not track marks awarded in Youth Explore Trades Sampler programs; however, ITA does track program completion as either pass or incomplete.

- Students who leave the class within the first week will be considered cancelled registrations
- Students who complete the class should be recorded as passed
- Students who leave the class after the first week should be recorded as incomplete

School Districts – School-Aged Students

Reporting to the Ministry of Education and Child Care (ECC)

- In order for school-aged students to receive credit for their participation in the program, the Career Educator or other Youth Explore Trades Sampler coordinator must submit a mark through the TRAX system by June 30 of the school year. These marks will have been provided to the school district or independent school authority by the post-secondary institution delivering the program.

Post-Secondary - School-aged & Adult students

Reporting to the school district – school aged students

- The post-secondary training provider must provide a report to the school district with the marks earned by each student. This form must be submitted to the school district within 15 days of completion of the program.
- **Appendix C** provides a sample of a Marks form Youth Explore Trades Sampler partners can use or adapt for reporting marks to the school district. You may choose to use any form which suits the secondary and post-secondary institution partners.



PART FOUR: YOUTH EXPLORE TRADES SAMPLER FUNDING OVERVIEW

There are two types of ITA funding for Youth Explore Trades Sampler programs:

Seat Funding

The post-secondary institution delivering the Youth Explore Trades Sampler will receive seat funding. Seats will be funded for 12 weeks at the Level 1 Foundation band at \$170 per week, or \$2,040 per seat. No more than 16 seats per cohort will be funded.

Tuition Subsidy

The school district or independent school authority will receive a tuition subsidy of \$250 per student for each school-aged youth registered in a Youth Explore Trades Sampler program. Post-secondary institutions delivering Youth Explore Trades Samplers have historically charged some tuition, on average \$750 per student, to school districts. This subsidy helps to offset the costs of tuition.

Tuition Fees

The training provider may charge the school district a tuition for each school-aged student registered in the program. The average tuition across BC is \$750 per student. The amount of tuition charged is to be determined by the training provider and the school district. School-aged students are not expected to pay any tuition fees. Adult students may be charged a tuition fee that is different from the amount a school district is charged.

Reconciliation Report

Public post-secondary institutions should also include Youth Explore Trades Sampler on their Reconciliation Reports.



PART FIVE: DELIVERING A YOUTH EXPLORE TRADES SAMPLER PROGRAM

This Program Guide is intended to help strengthen existing Youth Explore Trades Sampler programs, and to support the development of new programs.

Selection of Trades to Sample

Working with subject matter experts, ITA has produced core competencies at a Youth Explore Trades Sampler level for 10 trades. Each Youth Explore Trades Sampler program will select four or more trades to sample. If a program wishes to deliver training in a trade that is not included in the 10 trades, they may request permission to do so by contact the ITA Youth department at youth@itabc.ca. Training providers will be expected to submit a draft of the competencies they will cover, using a comparable template to the core competencies provided for the 10 trades.

Number of Youth and Adult Seats

A maximum of 16 seats will be funded per program. At least 12 of these seats should be filled by school-aged youth (completing the program before June 30 of the school year in which they turn 19). Where possible, ITA would prefer that programs be 100% youth; however, in some regions, it may be a challenge to fill a cohort 100% with youth, so in those instances, classes may be backfilled with adult fee-payers. Adult students will be responsible for paying the full tuition fee; ITA does not provide a \$250 subsidy for adult students.

Workforce Certificates

To help students increase their employability, it is recommended that Trades Sampler programs offer at least three workforce certificates. Two of those certificates should be Occupational First Aid Level 1 and WHMIS. The third certificate should be determined by the training provider based on the student's needs and/or on program constraints. There is no reporting required for these certificates back to the ITA, but these certificates should be included in the student's mark form from the training provider to the school district.

Program Credentialing

There are no credentials or hours towards apprenticeship earned through completion of this program. Students will complete workforce certificates that are recognized by industry. Any credit given by the post-secondary institution is to recognize the time spent at the institution; the credits do not need to transfer towards another program.

Youth Explore Trades Sampler is intended to be a partnership between post-secondary institutions and school districts or independent school authorities.

The programs may be delivered in whole or in part at a post-secondary institution. Distance from a post-secondary institution trades training facility can make it challenging for students to travel to the post-secondary institution for the full program. In the past, some programs have



used community or school training facilities, with post-secondary instructors delivering some or all of the training. The main instructor for each module must have relevant experience working in the trade, and should have Red Seal or other industry-recognized certification.

School District Delivery

ITA recognizes that some school districts are located too far away from a post-secondary Institution to participate in a Trades Sampler delivered at a post-secondary Institution. If your school district would like to deliver a Trades Sampler that would be delivered in the school district and supported by a post-secondary, please contact ITA Youth department for more information. This applies only to new programs, not to programs currently approved and running.

Institutions looking to deliver Youth Explore Trades Sampler will be asked to provide ITA with a program summary, including:

- Program outline
- Trades Training Continuation Supports
- Demand for Youth Explore Trades Sampler and numbers of cohorts requested
- School district or independent school authority and post-secondary partnerships

Supporting Trades Continuation

As part of program delivery, Youth Explore Trades Sampler instructors, college career advisors, and high school career departments are expected to engage individually with students to help identify their trades interests. If students are interested in continuing with trades training, they should be supported to determine which prerequisites they are likely to need in a particular trade, and to discuss their graduation plan and next steps for education/employment.

It is recommended that students participate in a Trades Pre-Test if available at the training provider. The ITA Essential Skills tool may also be used:

<http://www.ita.essentialskillsgroup.com/>

Youth Explore Trades Sampler Seat Funding Procedures

Public post-secondary institutions are expected to be the primary deliverers of the program, but ITA and the BC Ministry of Education and Child Care (ECC) are open to receiving proposals for different models.

Contact ITA at youth@itabc.ca to propose an alternate model.

- Public post-secondary institutions will include Trades Samplers as part of their annual training plan review for all intakes beginning in the next fiscal year.
- These training plans will be reviewed, and discussed with each institution as part of the ITA annual Training Plan conversations. To assist school districts in planning courses for students, ITA will send a provisional confirmation email by January 31 indicating the number of cohorts that will be funded for the following school year.



-
- Final confirmation of funding will be sent by March 31. Factors in numbers of cohorts funded will include maintaining momentum for successful programs, demonstrated demand for new courses, strength of program proposal, and historical Explore Trades Sampler delivery performance (if applicable).
 - Public post-secondary institutions who have demand for more cohorts than were funded may request repurposing funding for one Foundation cohort in order to instead deliver Explore Trades Sampler programs.



PART SIX: EXAMPLES OF YOUTH EXPLORE TRADES SAMPLER PROGRAM MODELS

There are many ways to structure a Youth Explore Trades Sampler Program in order to best fit into the school calendar and to best fit proximity to a post-secondary institution.

Program Scheduling

- On a semester system, the post-secondary institution can offer the program full-time for 10 to 12 weeks, followed by a full-time WEX program organized by the school district.

Or

- The post-secondary institution can offer the program part-time for 20 weeks. Students complete a part-time WEX placement organized and supervised by the school district parallel with the Youth Explore Trades Sampler.

Students on a linear system can drop year-long classes partway through to join a semester-based Trades Sampler.

Program Location:

In some cases, students would be required to travel long distances to complete training at a post-secondary institution. Options for program location include:

- A portion of the program can be taught at a school district location, with another portion taught at the post-secondary institution.
- The post-secondary institution could provide training in a mobile trailer.
- The school district could provide transit to the students to travel daily to the post-secondary institution. Funding may be available from the Ministry of Education and Child Care (ECC) Skills Access Grant to offset this cost.



Below are some examples of how the Youth Explore Trades Sampler has been delivered.

CALENDAR	LOCATION(S)	EXAMPLE
Semester system	Post-secondary location	<p>Northwest Community College (NWCC) works with surrounding school districts to align the delivery of a cohort to the semester system of the school. The Youth Explore Trades Sampler program is delivered at one of NWCC’s nine campuses.</p> <ul style="list-style-type: none"> ▪ Students attend the Youth Explore Trades Sampler program for a 10-week period in the second half of a semester, having completed secondary school course work in the first half of the semester, OR ▪ Students alternate weeks between the Youth Explore Trades Sampler and secondary school course work for the full 20 weeks of a semester
Semester system	Secondary location	<p>North Okanagan Shuswap School District No. 83 works with Okanagan College to deliver the Youth Explore Trades Sampler Program in a secondary school. In 2015–16 it was held in Enderby, and in 2016–17 in Sicamous. The program runs February to May, and is taught by an instructor from Okanagan College. In the month after the program, the students may complete a Work Experience, or other secondary school courses, through an alternative delivery format. In other districts, Okanagan College delivers the Trades Sampler program on one of their campuses.</p>
Semester system	Post-secondary and secondary locations	<p>Camosun College works with surrounding school districts to deliver a Youth Explore Trades Sampler program at a secondary school/community location, and at Camosun College. Instruction in some trades happens at the secondary location, and in other trades at Camosun College. The Trades Sampler instruction is 12 weeks long, but may be delivered over 20 weeks, depending on the district’s schedule.</p> <ul style="list-style-type: none"> ▪ Students may begin part-time Work Experience placements during the Trades Sampler program, and then move to full-time placements in the last weeks of the semester, OR ▪ Students may complete three one-week Work Experience placements throughout the 20-week program, OR ▪ Students may complete a three-week Work Experience placement after the program finishes
Linear system	Post-secondary location	<p>Most of the schools in Vancouver’s School District No. 39 use a linear, or full-year, school calendar. This makes it difficult to fit students into semester based delivery of dual credit programs, including the Youth Explore Trades Sampler. So, by using strategies similar to those used in the past for programs such as Youth Train in Trades, School District 39 has made it possible for some students to participate in the Youth Explore Trades Sampler offered at BCIT. Students may begin full-year classes that can be dropped partway through, or they can complete courses through alternative delivery formats. BCIT’s cohort includes students from several Lower Mainland districts, most of which use a semester system.</p>



Identification of Suitable and Eligible Students

ITA recommends that school districts or independent school authorities and post-secondary institutions work together to identify suitable and eligible students for Youth Explore Trades Sampler, including jointly interviewing applicants. Both the school district and post-secondary institution should agree that an applicant is suitable.

Some traits to look for in suitable candidates:

- **Interest:** Does the applicant demonstrate interest in the trades? Has the applicant completed any trades electives or Youth Explore Trades Skills (formerly called Skills Exploration)?
- **Career pathway:** Does the program align with their Personalized Learning and Career Plan?
- **Attendance:** Does the applicant have a good attendance record? If not, is there reason to believe that their attendance in Youth Explore Trades Sampler would be different?
- **Discipline record:** Does the applicant's discipline record warrant any concern? If yes, is there reason to believe that their behaviour in this program would be different?
- **Teacher/counsellor's reference:** A letter or statement of support from another teacher recommending the applicant for the program.
- **Interview:** Did the applicant's interview confirm suitability for the program?
- **Parent/guardian support:** Parent demonstration of support for the applicant to participate.
- **Individual Education Plan (IEP):** If the applicant has an IEP, has a copy been provided? Does the IEP indicate any concerns about the applicant's ability to do hands-on work, or about the applicant's suitability for the program?
- **Health:** Has the applicant been asked about any health issues that could be barriers to their participation in Youth Explore Trades Sampler, e.g., dust allergies, back pain, illicit drug use?
- **Transportation and other costs:** Have the applicant and/or parent demonstrated an understanding of the program costs and logistics?

Performance Measures

ITA will consider the following measures in assessing successful delivery of Youth Explore Trades Sampler:

- **Number of seats per cohort** – Less than 16 seats per cohort indicates lower demand. ITA recognizes that full cohorts may be more difficult in smaller communities.
- **Percent of students completing** – ITA understands that students do withdraw from programs as a matter of course but will monitor withdrawal rates and discuss higher-than-average withdrawal rates with Youth Explore Trades Sampler programs.



-
- **Percent of students continuing in trades training** – ITA will track student continuation in trades training from each program as part of their participation in the Youth Apprenticeship Program; this is not a requirement of the Youth Explore Trades Sampler.



PROGRAM GUIDE	
MODULE	COMPETENCY
LINE A Essential Skills	A1 Use communication skills
	A2 Use numeracy
	A3 Apply study skills
	A4 Work with others
	A5 Read and interpret drawings
LINE B Use Safe Work Practices	B1 Control workplace hazards
	B2 Use OH/S Regulations and WorkSafeBC Standards
	B3 Use personal protective equipment
	B4 Apply fire prevention
LINE C Workforce Certificates	C1 Use WHMIS
	C2 Use First Aid
	C3 Optional certificates
LINE D Employability/Employment Engagement	D1 Describe apprenticeship system
	D2 Attend a guest speaker event
	D3 Describe employer expectations
	D4 Attend work site visit
	D5 Work experience through school district (WEX)
LINE E Use Tools and Equipment	E1 Use common hand tools
	E2 Use common portable power tools
LINE F Sheet Metal Module	F1 Describe the sheet metal trade
	F2 Complete projects using appropriate materials, tools and equipment
LINE G Pipe Trades Module	G1 Describe the pipe trades
	G2 Describe safe work practices and control hazards
	G3 Describe and use tools and equipment
	G4 Complete projects using appropriate materials, tools and equipment
LINE H: Welding Module	H1 Describe the welding trade
	H2 Complete projects using appropriate materials, tools and equipment
LINE I Metal Fabrication Module	I1 Describe the metal fabrication trade
	I2 Describe safe work practices and control hazards
	I3 Describe and use tools and equipment
	I4 Complete projects using appropriate materials, tools and equipment
LINE J Carpentry Module	J1 Describe the carpentry trade
	J2 Complete projects using appropriate materials, tools and equipment
LINE K Electrical Module	K1 Describe the electrical trade
	K2 Complete projects using appropriate materials, tools and equipment
LINE L Automotive Service Technician Module	L1 Describe the automotive service technician trade
	L2 Complete projects using appropriate materials, tools and equipment
LINE M Heavy Duty Equipment Technician Module	M1 Describe the heavy duty equipment technician trade
	M2 Describe safe work practices and control hazards
	M3 Describe and use tools and equipment
	M4 Complete projects using appropriate materials, tools and equipment
LINE N Millwright Module	N1 Describe the millwright trade
	N2 Complete projects using appropriate materials, tools and equipment
LINE O Machinist Module	O1 Describe the machinist trade
	O2 Describe safe work practices and control hazards
	O3 Describe and use tools and equipment
	O4 Complete projects using appropriate materials, tools and equipment



LINE A: ESSENTIAL SKILLS

The purpose of the Essential Skills module is to highlight the expectations and requirements of apprentices in trade programs. Through these modules students will prepare themselves for successful employment in trades in BC.

Learning Outcomes:

At the end of these modules, learner will be able to:

Required:

1. Use communication skills to effectively communicate with coworkers in a workplace environment
2. Use numeracy skills to perform basic math required for competency in each trade area
3. Apply study skills to learn, retain and recall information gathered in course modules
4. Work well with others in a trade workplace environment
5. Read and interpret drawings used in trades

Competency A1	Use Communication Skills
Competency A2	Use Numeracy Skills
Competency A3	Apply Study Skills
Competency A4	Work With Others
Competency A5	Read and Interpret Drawings



Competency A1: Use Communication Skills

Brief Description

Customer service is an integral part of every business, whether it is a construction company, an automotive dealership or an appliance-servicing business. The foundation of good customer service is effective interpersonal communication. Interpersonal communication between co-workers and between supervisors and employees is necessary to ensure that the business is ready to meet the needs of the customers. Students will learn the importance of customer service, and effective ways to communicate.

Learning Tasks & Content

- | | |
|--|--|
| 1. Describe the principles of communication | <ul style="list-style-type: none"> ▪ Non-verbal communication ▪ Respect ▪ Listening skills ▪ Oral reports ▪ Appropriate use of phone ▪ Apprentice/journey person relations ▪ Employee/employer relations ▪ Customer relations ▪ Basic sales skills ▪ Communicating with other tradespeople |
| 2. Describe the procedures for giving and receiving feedback | <ul style="list-style-type: none"> ▪ Handling criticism ▪ Types of feedback |
| 3. Describe assertive behaviour | <ul style="list-style-type: none"> ▪ Aggressive ▪ Passive ▪ Rights and responsibilities ▪ Components of assertive behaviour ▪ Situations |
| 4. Describe conflict resolution techniques. | <ul style="list-style-type: none"> ▪ Ways to deal with conflict ▪ Resolution process ▪ Dealing with anger ▪ Handling customer complaints |
| 5. Describe effective problem-solving and decision-making | <ul style="list-style-type: none"> ▪ Identify the problem ▪ Search for alternatives ▪ Weigh the alternatives ▪ Make a choice ▪ Implement the choice ▪ Evaluate the results ▪ Creative thinking |



Competency A2: Use Numeracy Skills

Brief Description

Tradespeople take a variety of measurements using basic tools, they calculate and estimate the material requirements for projects, and they constantly compare measurements to specifications. Mathematical formulas relate to many trade areas, so they will be encountered by students in all sections of the program.

Learning Tasks & Content

- | | | |
|----|---|---|
| 1. | Add, subtract, multiply and divide | ▪ Whole numbers, fractions, decimals, percentages, ratios, proportion |
| 2. | Use formulas to calculate area | ▪ Circles, cylinders, squares, rectangles, triangles |
| 3. | Use formulas to calculate lineal measurements | ▪ Perimeter
▪ Circumference |
| 4. | Use the Pythagorean theorem of right angles | ▪ Hypotenuse, opposite side, adjacent side |



Competency A3: Apply Study Skills

Brief Description

The learning tasks in this module will be new material for some and a valuable refresher for others. Time spent on these learning tasks will increase the effectiveness of time spent on all future training. In addition, the skills learned will be a valuable asset in the continuing acquirement of skills and knowledge informally on the job.

Learning Tasks & Content

- | | |
|--|--|
| 1. Use effective study habits | <ul style="list-style-type: none"> ▪ Preparing ▪ Support ▪ Study environments ▪ Time management ▪ Group study ▪ Problem solving ▪ Lifelong learning |
| 2. Use effective listening techniques | <ul style="list-style-type: none"> ▪ Listening skills ▪ Asking questions ▪ Participation |
| 3. Use effective note-taking techniques | <ul style="list-style-type: none"> ▪ Preparation prior to lesson ▪ During the lesson ▪ After the lesson ▪ Summary |
| 4. Use techniques for reading textbooks effectively | <ul style="list-style-type: none"> ▪ Textbook reconnaissance ▪ Identifying objectives ▪ Recall ▪ Review ▪ Recite |
| 5. Use ways to research material | <ul style="list-style-type: none"> ▪ Develop outlines ▪ Library ▪ Computer |
| 6. Use effective techniques for preparing for and taking tests | <ul style="list-style-type: none"> ▪ Rest ▪ Practice tests ▪ Punctuality |



Competency A4: Work With Others

Brief Description

The learning tasks in this module will cover common issues when working with others in a trade environment. Students will be able to develop skills that will enable them to work collaboratively on projects.

Learning Tasks & Content

1. Teamwork
 - Expectations of others
 - Taking turns/sharing the workload
 - Supportive comments
 - Focus on task
 - Peer-to-peer feedback
-



Competency A5: Read and Interpret Drawings

Brief Description

Tradespeople are required to interpret a variety of drawings. For example, it is important to read construction drawings correctly to learn how plumbing, electrical, carpentry and mechanical installations need to be coordinated. Students will be introduced to reading and interpreting drawings.

Learning Tasks & Content

- | | |
|---|---|
| 1. Use scale rulers to determine actual dimensions from a drawing | <ul style="list-style-type: none">▪ Scale rulers▪ Typical scales |
| 2. Describe lettering and dimensioning in drawings | <ul style="list-style-type: none">▪ Hidden lines▪ Object lines▪ Border lines▪ Centre lines▪ Dimension lines▪ Extension lines▪ Phantom lines▪ Cutting plane lines |
| 3. Describe drawing projections | <ul style="list-style-type: none">▪ Isometric▪ Oblique▪ Perspective▪ Third angle orthographic |



LINE B: USE SAFE WORK PRACTICES

The purpose of the Use Safe Work Practices module is to identify the dangers and risks of working in trades. This module provides students with the knowledge and skills required to navigate and minimize the risks through education, practice and demonstration of safe work practices.

Learning Outcomes:

At the end of this module, students will be able to:

1. Control short- and long-term hazards and minimize them through safe work procedures.
2. Describe the requirements, responsibilities and regulations for workplace safety outlined in the Worker's Compensation Act and Occupational Health and Safety Regulation.
3. Use personal protective equipment (PPE) effectively according to requirements for each trade area.
4. Apply fire prevention techniques to reduce the risk of fire in the workplace.
5. Use fall protection devices as per required by WorkSafeBC guidelines for each trade area.
6. Work safely in confined spaces through identification of risks, precautions, applying knowledge and skills

Competency B1	Control Workplace Hazards
Competency B2	Use OH/S Regulation and WorkSafeBC Standards
Competency B3	Use Personal Protective Equipment
Competency B4	Apply Fire Prevention



Competency B1: Control Workplace Hazards

Brief Description

Workplace hazards include both short-term and long-term hazards that can cause injury, illness or death. Students will learn how to establish control measures to manage these hazards.

Learning Tasks & Content

- | | |
|---|--|
| 1. Describe short-term hazards in the trades | <ul style="list-style-type: none"> ▪ Excavations ▪ Working around heavy equipment ▪ Sharp objects ▪ Ladders ▪ Work platforms ▪ Confined space ▪ Electrical ▪ Lockout procedures ▪ Compressed gas ▪ Explosive material (dust) ▪ Lifting <ul style="list-style-type: none"> ▪ Procedures ▪ Personal apparel <ul style="list-style-type: none"> ▪ Clothing ▪ Hair and beards ▪ Jewelry ▪ Housekeeping ▪ Horseplay ▪ Respect for others safety ▪ Constant awareness of surroundings ▪ Safe attitude ▪ Management of hazards ▪ Weather |
| 2. Describe long-term hazards in the trades | <ul style="list-style-type: none"> ▪ Respiratory disease ▪ Repetitive strain injuries ▪ Management of hazards |
| 3. Describe emergency procedures | <ul style="list-style-type: none"> ▪ Emergency shutoffs ▪ Fire control systems ▪ Eye wash facilities ▪ Emergency exits ▪ Emergency contact/phone numbers ▪ Outside meeting place ▪ Disaster meeting place |
| 4. Describe non-emergency injury reporting procedures | <ul style="list-style-type: none"> ▪ First aid facilities ▪ Report |



Learning Tasks & Content

- 5. Describe lockout and tag-out procedures
 - Understanding of system operation
 - Components requiring lockout
 - Identification requirements
 - Situations where lockout is required
-



Competency B2: Use OH/S Regulation and WorkSafeBC Standards

Brief Description

Health and safety regulations set requirements for workplace safety, and outline the rights and responsibilities of the employer and employees. Students will learn how to access and implement these regulations.

Learning Tasks & Content

- | | |
|--|---|
| 1. Use terms found in the Workers Compensation Act | <ul style="list-style-type: none"> ▪ Definitions, Section 1 of the Act |
| 2. Describe the conditions under which compensation will be paid | <ul style="list-style-type: none"> ▪ Part 1, Division 2 of the Act |
| 3. Describe the general duties of employers, employees and others | <ul style="list-style-type: none"> ▪ Part 2, Division 3, Sections 115–124 of the Act |
| 4. Describe the Workers Compensation Act requirements for the reporting of accidents | <ul style="list-style-type: none"> ▪ Part 1, Division 5, Sections 53 and 54 of the Act |
| 5. Describe the Core Requirements of the Occupational Health and Safety Regulation | <ul style="list-style-type: none"> ▪ Definitions ▪ Application ▪ Rights and Responsibilities <ul style="list-style-type: none"> ▪ Young worker orientation ▪ Right to refuse work ▪ Health and safety programs ▪ Contractor’s safety policy manuals ▪ Investigations and reports ▪ Workplace inspections ▪ General Conditions <ul style="list-style-type: none"> ▪ Building and equipment safety ▪ Emergency preparedness ▪ Preventing violence ▪ Working alone ▪ Ergonomics ▪ Illumination ▪ Indoor air quality ▪ Smoking and lunchrooms |



Learning Tasks & Content

6. Describe the General Hazard Requirements of the Occupational Health and Safety Regulation (Book 2)
 - Chemical and biological substances
 - Substance-specific requirements
 - Noise, vibration, radiation and temperature
 - Personal protective clothing and equipment
 - Confined spaces
 - De-energizing and lockout
 - Fall protection
 - Tools, machinery and equipment
 - Ladders, scaffolds and temporary work platforms
 - Cranes and hoists
 - Rigging
 - Mobile equipment
 - Transportation of workers
 - Traffic control
 - Electrical safety
-



Competency B3: Use Personal Protective Equipment

Brief Description

Special personal protective equipment is required on the jobsite. The equipment used will depend on the hazards anticipated. Students will learn how to select the proper protective equipment for the situation.

Learning Tasks & Content

1. Describe personal protective equipment requirements
 - WorkSafeBC regulations
 - Safety footwear
 - CSA Standards
 - Eye protection
 - Glasses
 - Goggles
 - Face shields
 - Hearing protection
 - Hearing testing
 - Earplugs and canal caps
 - Earmuffs
 - Class/grade selection based on exposure level
 - Head protection
 - CSA and ANSI types
 - Respiratory protection
 - Respirator types
 - Positive and negative seal check
 - Fit testing
 - Types of breathing hazards
 - Filters and cartridges
 - Protection factors
 - Warning signs of respirator failure
 - Clothing
 - High visibility
 - Hazard/product specific
 - Hand protection
 - Gloves
 - Barrier creams
 - Knee protection
2. Describe using personal protective equipment.
 - Selection
 - Purpose
 - Training requirements
 - Inspection
 - Maintenance
 - Storage



Competency B4: Apply Fire Prevention

Brief Description

Processes that employ the use of open flame present a fire hazard. Examples include soldering, brazing, oxy-fuel cutting and welding. Students will learn the safe and appropriate ways to handle these hazards.

Learning Tasks & Content

- | | |
|---|--|
| 1. Describe the conditions necessary to support a fire | <ul style="list-style-type: none"> ▪ Oxygen ▪ Fuel ▪ Ignition |
| 2. Describe the classes of fires according to the materials being burned | <ul style="list-style-type: none"> ▪ Class A ▪ Class B ▪ Class C ▪ Class D ▪ Symbols and colours |
| 3. Apply preventative fire safety precautions when working near, handling or storing flammable liquids or gases, or any combustible materials | <ul style="list-style-type: none"> ▪ Hot work permit (site-specific) ▪ Handling and storage of flammable materials ▪ Ventilation ▪ Symbols ▪ Fuels <ul style="list-style-type: none"> ▪ Diesel ▪ Gasoline ▪ Propane ▪ Natural Gas ▪ Lubricants ▪ Oily rags ▪ Combustible metals ▪ Aerosols |
| 4. Describe the considerations and steps to be taken prior to fighting a fire. | <ul style="list-style-type: none"> ▪ Warning others and fire department ▪ Evacuation of others ▪ Fire contained and not spreading ▪ Training |
| 5. Describe the procedure for using a fire extinguisher | <ul style="list-style-type: none"> ▪ Extinguisher selection ▪ P.A.S.S.: <ul style="list-style-type: none"> ▪ Pull ▪ Aim ▪ Squeeze ▪ Sweep |



LINE C: WORKFORCE CERTIFICATES

The Workforce Certificates earned in this Trades Sampler program provide students with the necessary skills and knowledge required to work safely in a trade environment. The certificates also provide increased employability of the students because they are more job-ready upon completion of the program. Students will complete at least three modules: WHMIS and First Aid are recommended, and other modules are selected from the list.

Learning Outcomes:

At the end of this modules, students will be able to:

1. Use Workplace Hazardous Materials Information System (WHMIS) to identify the risks with using different hazardous materials in a work place environment.
2. Use basic First Aid procedures to respond to a work place accident.
3. Complete one or more of the modules in the list below (or other, as required regionally)

Optional certificates:

- Aerial/Scissor Lift Training
- Confined Space Awareness
- Confined Space Entry
- Construction Safety Training System
- Electrical Safety Awareness
- Fall Protection
- Fork Lift Operator
- Forklift Safety
- Ground Disturbance
- H2S Alive
- Ladder Safety Training
- Petroleum Safety Training
- Rigging and Lifting
- Skid Steer Operator Training
- Workplace Bullying and Harassment

Competency C1	Use WHMIS
Competency C2	Use First Aid
Competency C3	Select a Course from the List of Certificates



Competency C1: Use WHMIS

Brief Description

The main purpose of provincial WHMIS legislation is to require employers to obtain health and safety information about hazardous materials in the workplace and pass this information on to workers. Students will complete and receive certification in WHMIS.

Learning Tasks & Content

1. Students will complete a WHMIS course delivered by a certified training provider.
-



Competency C2: Use First Aid

Brief Description

Emergency situations can occur at the workplace or at home. Having these basic skills will give students the confidence to manage an emergency situation. Students will complete Level 1 First Aid training

Learning Tasks & Content

1. Students will complete a Level 1 First Aid course delivered by a certified training provider.
-



Competency C3: Select a course from the list of certificates

Brief Description

Select a course(s) from the list of the certificates or include another regionally specific certificate based on the needs of your geographic region or employer needs.

Learning Tasks & Content

- Aerial/Scissor Lift Training
- Confined Space Awareness
- Confined Space Entry
- Construction Safety Training System
- Electrical Safety Awareness
- Fall Protection
- Fork Lift Operator
- Forklift Safety
- Ground Disturbance
- H2S Alive
- Ladder Safety Training
- Petroleum Safety Training
- Rigging and Lifting
- Skid Steer Operator Training
- Workplace Bullying and Harassment



LINE D: EMPLOYABILITY/EMPLOYMENT ENGAGEMENT

The Employability/Employment Engagement module is to connect students into the workforce through work experience, site visits and guest speakers. Connections created through this module will provide a path for students to gain employment in the trade area of their interest. The work experience portion (WEX) is to be done through the high school and is in addition to the Trade Sampler program.

Learning Outcomes:

At the end of this modules, students will be able to:

1. Describe the steps involved in completing an apprenticeship in BC
2. Describe the key points of a specific trade after hearing a guest speaker present.
3. Describe the conditions, requirements, and daily duties of a tradesperson working at that employer’s work site.
4. Observe the workplace for different trades to see what a day in the life of a tradesperson looks like.
5. Work in a trade environment to gain insight into the expectations of the trade on a daily basis

Competency D1	Describe Apprenticeship System
Competency D2	Attend A Guest Speaker Event
Competency D3	Describe Employer Expectations
Competency D4	Attend A Work Site Visit
Competency D5	Work Experience



Competency D1: Describe Apprenticeship System

Brief Description

When considering entering a trade, it is paramount to understand the type of work done by each of the trades.

Apprenticeship programs are generally administered by provincial and territorial departments responsible for education, labour and training, with authority delegated from the legislation in each province and territory. Students will be introduced to the services offered by the Provincial Apprenticeship Office and the administrative processes that are directly related to an apprentice.

Learning Tasks & Content

1. Describe the Provincial Apprenticeship Office
 - Apprentice registration
 - Registration form
 - Registration card
 - Program requirements
 - Program outlines
 - Sponsor responsibilities
 - Apprentice responsibilities
 - Registration card
2. Describe the Interprovincial Standards Red Seal
 - Purpose
 - Web site
 - Human Resource and Skills Development Canada (HRSDC)
 - Canadian Council of Directors of Apprenticeship (CCDA)
 - Ellis chart
 - National Occupational Analysis (NOA)
 - Interprovincial exams



Competency D2: Attend a Guest Speaker Event

Brief Description

Students will be required to attend a guest speaker event to hear a tradesperson, employer or industry representative speak about their trade. This is to be organized through the post-secondary Institution and should be an event for the entire class. Guest speaker events may occur as frequent as possible, based on timing and the availability of presenters. The key objective is to provide students with an overview of the trade area and employment opportunities, and to answer any questions. These should be engaging, interactive events.

Learning Tasks & Content

1. Attend a guest speaker event
 - Identify which trade the student is interested in pursuing
 - Identify guest speakers
 - Tradespeople
 - Employers
 - Industry/union representatives
 - Provide students with some context and time to prepare questions



Competency D3: Describe Employer Expectations

Brief Description

A tradesperson needs to meet employer's expectations, act professionally with customers and get along with your co-workers. Change is accelerating rapidly, so becoming informed about the trends that are transforming work and the workplace will assist in planning for and adapting to these changes. Students will be introduced to these concepts.

Learning Tasks & Content

- | | |
|---|---|
| 1. Describe employer expectations and job satisfaction | <ul style="list-style-type: none"> ▪ Attendance ▪ Punctuality ▪ Time management ▪ Doing it right ▪ Employee evaluation ▪ Job satisfaction |
| 2. Describe how to maintain customer and co-worker relations | <ul style="list-style-type: none"> ▪ Acting professionally ▪ Respect others |
| 3. Describe stress management techniques. | <ul style="list-style-type: none"> ▪ Levels of stress ▪ Balance ▪ Stress busters |
| 4. Describe the trends affecting employment in the Canadian economy | <ul style="list-style-type: none"> ▪ Innovations ▪ Globalization ▪ Environmental concerns ▪ Small business growth ▪ Diversity ▪ Employment skills |
| 5. Describe effective problem-solving and decision-making | <ul style="list-style-type: none"> ▪ Identifying the problem ▪ Searching for alternatives ▪ Weighing the alternatives ▪ Making a choice ▪ Implementing the choice ▪ Evaluating the results ▪ Creative thinking |



Competency D4: Attend a Work Site Visit

Brief Description

Students will be required to attend a work site visit in a trade they are interested in pursuing. This is to be organized by the post-secondary Institution and is part of the Trade Sampler program. Students may visit the site as a class or as an individual.

Learning Tasks & Content

1. Attend a work site visit
 - Identify which trade the student is interested in pursuing
 - Identify employers who are willing to take a class, small group or individual on a work site tour
 - Ensure students are briefed on the safety requirements and expectations of the work site visit
-



Competency D5: Work Experience

Brief Description

Students will be required to complete a work experience (WEX) program through their high school. Students should find an employer in the trade area they are considering working in to gain insight into the trade and the daily life of a tradesperson in that field.

Ministry Work Experience 12A and Work Experience 12B are each 100–120 hours long and worth 4 credits. In conjunction with Work Experience-based IDS, students can receive up to 16 credits for work experience.

Learning Tasks & Content

1. Student should contact school WEX coordinator to identify an employer
 - Identify which trade the student is interested in pursuing
 - Complete a WEX module of approximately 120 hours



LINE E: USE TOOLS AND EQUIPMENT

The Tools and Equipment module provides students the overview of general tools used in each trade area as well as the safety procedures for correct use of each tool. This module can be delivered separately or also combined into each trade area for just in time delivery of the tools for each trade area.

Learning Outcomes:

At the end of this modules, students will be able to:

Required:

1. Explain the use and maintenance of general hand tools for each trade area.
2. Explain the use and maintenance of general power tools for each trade area.

Competency E1	Use Common Hand Tools
Competency E2	Use Common Portable Power Tools



Competency E1: Use Common Hand Tools

Brief Description

Every job starts with the use of hand tools and they are an element of every trade. Students will be introduced to the most common hand tools use in many different trades.

Learning Tasks & Content

1. Describe hand tools used in the trades
 - Cutting tools
 - Measuring, marking, and squaring tools
 - Bracing and securing tools
 - Hammering tools
 - Punches
 - Leveling tools
 - Wrenches
 - Ratchet and socket sets
 - 1/4"
 - 3/8"
 - 1/2"
 - Pliers
 - Vice grips
 - Screwdrivers
 - Taps and dies
 - Wheel and gear pullers
 - Pry bars and nail pullers
 - Digging Tools
2. Explain use and maintenance of hand tools
 - Types
 - Parts
 - Purpose/uses
 - Procedures/operations
 - Safety
 - Adjustment
 - Inspection
 - Maintenance
 - Storage



Competency E2: Use Common Portable Power Tools

Brief Description

Portable power tools play a major role in virtually every trade. In the trades, the worker will be expected to be familiar with a wide range of portable power tools, and students will become competent using a variety of portable power tools.

Learning Tasks & Content

1. Describe portable power tools
 - Electric
 - Pneumatic
 - Powder actuated
 - Training requirements
 - Types of charges
 - Types of fasteners
 - Methods of propulsion
 - Cutting tools
 - Grinding and abrasive tools
 - Drilling and boring tools
 - Accessories
2. Explain the use and maintenance of portable power tools
 - Types
 - Parts
 - Purpose/Uses
 - Procedures/Operations
 - Safety
 - Adjustment
 - Inspection
 - Maintenance
 - Storage



LINE F: SHEET METAL MODULE

In this module students are introduced to the sheet metal trade and its various career options including general sheet metal, architectural sheet metal, and aircraft manufacturing. Students will create 3-D objects from 2-D sheets of metal.

Learning Outcomes:

At the end of this module, students will be able to:

1. Describe the sheet metal trade and associated careers.
 - a. Describe the scope of work and the role of a sheet metal worker.
 - b. Describe the history and culture of the sheet metal trades.
2. Describe and use safe shop practices and control hazards in a sheet metal shop.
 - a. Follow emergency procedures and protocols in the sheet metal shop.
 - b. Use personal protective equipment (PPE) appropriate to the sheet metal shop.
 - c. Identify hazards and apply the appropriate control measure.
3. Use hand and power tools, and stationary equipment common to sheet metal fabrication.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of select sheet metal tools and equipment.
4. Fabricate sheet metal products using appropriate materials, tools, equipment, and safety procedures.
 - a. Select the material appropriate to the project.
 - b. Interpret shop drawings to measure and lay out projects.
 - c. Select and use the tools and equipment appropriate to the project.
 - d. Fabricate and assemble projects using safe practices and procedures.

Competency F1	Describe the Sheet Metal Trade and Associated Careers
---------------	---



Competency F1: Describe the Sheet Metal Trade and Associated Careers

Brief Description

Students will be introduced to the sheet metal trade and shown what essential skills are necessary to be successful in the trade. Students will also be introduced to various materials and processes used by a sheet metal worker.

Learning Tasks & Content

- | | |
|--|--|
| 1. Explain the scope of the sheet metal trade | <ul style="list-style-type: none">Identify the career options within the sheet metal trade<ul style="list-style-type: none">HVACCustom workSign manufacturingShipbuildingArchitectural sheet metalAircraft manufacturingTechnology within sheet metal<ul style="list-style-type: none">CNC machines<ul style="list-style-type: none">PlasmaLaserWater JetPattern development programs |
| 2. Describe the role of a sheet metal worker | <ul style="list-style-type: none">Explain the essential skills required to become a sheet metal workerDescribe the major steps involved in the layout and preparation of materialDescribe the major processes involved in shop forming of sheets, plates and extruded shapes |
| 3. Describe the history of the sheet metal trade | <ul style="list-style-type: none">Describe early techniques used to sever, form and join metalsDescribe the history of metallurgy:<ul style="list-style-type: none">Metals technology developmentDevelopment of alloysHistory of metal work |
| 4. Identify requirements for certification | <ul style="list-style-type: none">Identify requirements for BC Certificate of Qualification and Interprovincial Red SealFoundation programSheet metalArchitectural sheet metalAircraft manufacturing |



LINE F – SHEET METAL MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
<p>Task 1 – Cutting Exercise</p> <p>1 day (Day 1)</p>	<ul style="list-style-type: none"> ▪ Safe use of sheet metal hand tools ▪ Safe use of sheet metal shop equipment ▪ Lay out various shapes on metal ▪ Cut out various shapes 	<ul style="list-style-type: none"> ▪ Use safety checklist and demo safe use of shop equipment ▪ Demo safe and proper use of sheet metal hand tools ▪ Demo layout procedure for different shapes on metal ▪ Demo proper use of hand tools to cut out shapes on metal ▪ Students to do layout and cutting exercise twice 	<ul style="list-style-type: none"> ▪ Sheet metal shear ▪ Assorted sheet metal layout tools ▪ Assorted sheet metal hand tools ▪ 26 gauge metal 	<ul style="list-style-type: none"> ▪ CSA-approved safety glasses ▪ Safety features of shear ▪ Proper use of shear ▪ Proper use of hand tools ▪ CSA-approved leather steel-toe boots
<p>Task 2 – Square Box with Lid</p> <p>½ day (Day 2)</p>	<ul style="list-style-type: none"> ▪ Calculate cut sizes ▪ Cut metal to proper dimensions ▪ Layout ▪ Fabricate 	<ul style="list-style-type: none"> ▪ Students to calculate cut sizes ensure correct ▪ Demo layout and cutting of box and lid patterns ▪ Demo proper bending procedures to fabricate box ▪ Demo spot welder to fasten corners ▪ Students to complete two box and lid projects 	<ul style="list-style-type: none"> ▪ 26 gauge metal ▪ Sheet metal shear ▪ Sheet metal brake ▪ Assorted sheet metal layout and hand tools ▪ Spot welder 	<ul style="list-style-type: none"> ▪ CSA-approved safety glasses ▪ Safety shield for spot welder ▪ Proper use of spot welder to avoid burns ▪ Proper use of brake



LINE F – SHEET METAL MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
<p>Task 3 – Rectangular Box with Lid</p> <p>½ day (Day 2)</p>	<ul style="list-style-type: none"> Calculate cut sizes Cute metal to proper dimensions Layout Fabricate 	<ul style="list-style-type: none"> Students to calculate cut sizes ensure correct Demo layout and cutting of box and lid patterns Demo proper bending procedures to fabricate box Demo spot welder to fasten corners Students to complete two box and lid projects 	<ul style="list-style-type: none"> 26 gauge metal Sheet metal shear Sheet metal brake Assorted sheet metal layout and hand tools Spot welder 	<ul style="list-style-type: none"> CSA-approved safety glasses Safety shield for spot welder Proper use of spot welder to avoid burns Proper use of brake
<p>Task 4 – Sloping Box Exercise</p> <p>½ day (Day 3)</p>	<ul style="list-style-type: none"> Calculate cut sizes Cut metal to proper dimensions Layout Fabricate 	<ul style="list-style-type: none"> Students to calculate cut sizes ensure correct Demo layout and cutting of box & lid patterns Demo proper bending procedures to fabricate box Demo spot welder to fasten corners Students to complete two box and lid projects 	<ul style="list-style-type: none"> 26 gauge metal Sheet metal shear Sheet metal brake Assorted sheet metal layout and hand tools Spot welder 	<ul style="list-style-type: none"> CSA-approved safety glasses Safety shield for spot welder Proper use of spot welder to avoid burns Proper use of brake



LINE F – SHEET METAL MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Task 5 – Tool Box (26 gauge) with Pittsburgh Seam ½ day (Day 3)	<ul style="list-style-type: none"> Calculate cut sizes Practice Pittsburgh seam Cut metal to proper dimensions Layout Fabricate 	<ul style="list-style-type: none"> Calculate cut sizes for project Cut pieces needed Cut pieces to practice Pittsburgh seam Demo layout and notching for project Demo Pittsburgh lock former Practice Pittsburgh seams Fabricate tool box 	<ul style="list-style-type: none"> 26 gauge metal Shear Brake Spot welder Layout and hand tools Pittsburgh lock former 	<ul style="list-style-type: none"> CSA-approved safety glasses Safety shield for spot welder Proper use of spot welder to avoid burns Proper use of brake Proper use of Pittsburgh lock former
Task 6 – Tool Box (22 gauge) with Riveted Seam 1 day (Day 4)	<ul style="list-style-type: none"> Calculate cut sizes Practice Pittsburgh seam Cut metal to proper dimensions Layout Fabricate 	<ul style="list-style-type: none"> Calculate cut sizes for project Cut pieces needed Cut pieces to practice riveting Demo layout and notching for project Demo hand riveting Practice riveting Fabricate tool box 	<ul style="list-style-type: none"> 22 gauge metal Shear Brake Layout and hand tools 1/8" rivets 5/32" hand punch Electric drill with 5/32" drill bit Rivet set 	<ul style="list-style-type: none"> CSA-approved safety glasses CSA-approved steel-toe boots Safe and proper use of cordless drill Proper use of hand punch Proper use of rivet set
Task 7 – Finish Projects 1 day (Day 5)	<ul style="list-style-type: none"> Finish any projects or redo any components 			



LINE G: PIPE TRADES MODULE

In this module students are introduced to the pipe trade and its various career options, including plumbing, pipe/steam fitting, gas fitting and sprinkler fitting. Students will create piping systems using appropriate practices, material, tools and equipment.

Learning Outcomes:

At the end of this module, students will be able to:

1. Describe the pipe trades and associated careers.
 - a. Describe the scope of work and the culture of various pipe trades.
 - b. Describe the certification process of the various pipe trades.
2. Describe and use safe shop practices and control hazards in the pipe trades.
 - a. Follow emergency procedures and protocols in the piping shop.
 - b. Use personal protective equipment (PPE) appropriate to the pipe trades.
 - c. Identify hazards and apply the appropriate control measure.
3. Use hand and power tools, and equipment common to the pipe trades.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of select pipe trade tools and equipment.
4. Construct piping systems using appropriate materials, tools, equipment, and safety procedures.
 - a. Select the material appropriate to the project.
 - b. Interpret shop drawings and follow verbal instructions to plan, measure and lay out projects.
 - c. Select and use the tools and equipment appropriate to the project.
 - d. Construct and assemble projects using safe practices and procedures.

Competency G1	Describe the pipe trades
Competency G2	Use safe work practices in the pipe trades
Competency G3	Use pipe trades tools and equipment
Competency G4	Construct and assemble projects



Competency G1: Describe the Pipe Trades and Associated Careers

Brief Description

Students will be introduced to the pipe trades, including plumbing, pipe/steam fitting, sprinkler fitting, gas fitting and refrigeration. Students will be introduced to the basic skills necessary for success in the pipe trades including skills in reading, numeracy and document processing.

Key attributes for people entering the pipe trades are good mechanical, mathematical and spatial visualization skills; effective communication skills to communicate with co-workers and clients; analytical/problem-solving skills to interpret building plans, inspect piping systems and diagnose system faults and/or malfunctions.

Learning Tasks & Content

1. Describe the different pipe trades
 - Describe basic tasks of pipe trades
 - Compare and contrast pipe trades
 - Describe essential skills required in pipe trades
 - Describe ITA and requirements for BC Certificate of Qualification and IP Red Seal related to pipe trades
 - Describe ITA program outlines related to pipe trades



Competency G2: Use Safe Work Practices in the Pipe Trades

Brief Description

Knowledge and application of a safe working environment is essential to the pipe trade industry. Students will be introduced to a variety of shop or workplace hazards typically seen in the piping industry. Students will learn about minimizing the risks and managing these hazards, both short- and long-term.

Learning Tasks & Content

<p>1. Demonstrate emergency and non-emergency procedures in the pipe metal shop</p>	<p>Identify where the following are located:</p> <ul style="list-style-type: none"> ▪ Emergency shutoffs ▪ Fire control systems ▪ Eye wash facilities ▪ Emergency exits ▪ Emergency contact/phone numbers ▪ Outside meeting place ▪ Disaster meeting place ▪ First aid facilities
<p>2. Describe short-term hazards in the pipe trades</p>	<ul style="list-style-type: none"> ▪ Specialty tools ▪ Compressed gas-acetylene ▪ Pinch points ▪ Sharp objects ▪ Personal apparel <ul style="list-style-type: none"> ▪ Clothing ▪ Hair and beards ▪ Jewellery ▪ Housekeeping ▪ Horseplay ▪ Respect for others safety ▪ Constant awareness of surroundings ▪ Safe attitude ▪ Management of hazards
<p>3. Describe long-term hazards in the pipe trades</p>	<ul style="list-style-type: none"> ▪ Respiratory disease ▪ Repetitive strain injuries ▪ Management of hazards
<p>4. Describe and use PPE as required in the pipe trades</p>	<ul style="list-style-type: none"> ▪ Footwear ▪ Safety glasses ▪ Hearing protection ▪ Gloves



Competency G3: Use Pipe Trade Tools and Equipment

Brief Description

Tools and equipment specifically designed for the pipe trades must be used, maintained and stored in a safe manner. Students will be introduced to these specialty tools and equipment. The student will learn how to select and identify the proper tool for the job, as well as the safe operation of it.

Learning Tasks & Content

- | | |
|---|---|
| 1. Identify and describe hand tools used in the pipe trades | <ul style="list-style-type: none"> ▪ Threading tool ▪ Flaring tool ▪ Tubing bender ▪ Expanding and crimping tool ▪ Pipe wrench ▪ Snap cutter |
| 2. Identify and describe pipe trade portable power tools | <ul style="list-style-type: none"> ▪ Threader Rothenburger ▪ Hole Hawg ▪ Reciprocating saw ▪ ProPress ▪ WIRSBO cordless |
| 3. Identify and describe pipe trade stationary power tools | <ul style="list-style-type: none"> ▪ Threading tools ▪ Specialty tools |
| 4. Use pipe trade tools | <ul style="list-style-type: none"> ▪ Safety ▪ Parts ▪ Purpose/Uses ▪ Procedures/Operations ▪ Capacities ▪ Adjustment ▪ Inspection ▪ Storage |
| 5. Identify and describe pressure measuring tools | <ul style="list-style-type: none"> ▪ Manometers <ul style="list-style-type: none"> ▪ Types ▪ Filling ▪ Fluids ▪ Mechanical gauges |



Learning Tasks & Content

- | | |
|---|--|
| 6. Identify and describe manometers and mechanical gauges | <ul style="list-style-type: none"> ▪ Gas pressures <ul style="list-style-type: none"> ▪ Standing line pressures ▪ Operating line pressures ▪ Gauge pressures ▪ Diagnostics <ul style="list-style-type: none"> ▪ Pressure tests ▪ Leak detection |
| 7. Identify and describe the use of levels | <ul style="list-style-type: none"> ▪ Spirit level with slope gradient vial ▪ 24" spirit level |
| 8. Describe and use soldering techniques | <ul style="list-style-type: none"> ▪ Safety ▪ Housekeeping ▪ Selection ▪ Limitations ▪ Inspection |
| 9. Describe air-acetylene | <ul style="list-style-type: none"> ▪ Applications/uses ▪ Operating pressures ▪ Maintenance of tips and regulators ▪ Safe handling and storage |
| 10. Use air-acetylene | <ul style="list-style-type: none"> ▪ Soldering <ul style="list-style-type: none"> ▪ Selection of solder ▪ Use of solder ▪ Joint preparation ▪ Positions ▪ Application of heat |



Competency G4: Construct Piping Systems

Brief Description

Students will create piping systems using appropriate material, practices, tools and equipment.

Learning Tasks & Content

- 1 Construct piping systems using appropriate materials, tools, equipment, and safety procedures.
 - Select the material appropriate to the project
 - Pipe
 - Tubing
 - Fittings
 - Valves
 - supports
 - Interpret shop drawings and follow verbal instructions to plan, measure and lay out projects
 - Codes
 - Regulations
 - Drawings
 - Calculations
 - Select and use the tools and equipment appropriate to the project
 - Construct and assemble projects using safe practices and procedures



LINE H: WELDING MODULE

In this module students are introduced to the welding trade and its various career options. Students will use appropriate practices, material, tools and equipment to complete a variety of welding processes.

Learning Outcomes:

At the end of this module, students will be able to:

1. Describe the welding trade and associated careers.
 - a. Describe the scope of work and the role of a welder.
 - b. Describe the history and culture of the welding trade.
2. Describe and use safe shop practices and control hazards in a welding shop.
 - a. Follow emergency procedures and protocols in the welding shop.
 - b. Use personal protective equipment (PPE) appropriate to the welding shop.
 - c. Identify hazards and apply the appropriate control measure.
3. Use hand and power tools, and stationary equipment common to the welding trade.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of select welding tools and equipment.
4. Complete welding processes using appropriate materials, tools, equipment, and safety procedures.
 - a. Select the material appropriate to the process.
 - b. Interpret shop drawings to identify welds.
 - c. Select and use the tools and equipment appropriate to the welding process.
 - d. Complete welds using safe practices and procedures.

Competency H1	Describe the welding trade
---------------	----------------------------



Competency H1: Describe the Welding Trade and Associated Careers

Brief Description

Students will be introduced to the welding trade and shown what essential skills are necessary to be successful in the trade. Students will also be introduced to various types of employment, welding specialty certifications and technology within the welding field.

Learning Tasks & Content

- | | |
|---|--|
| 1. Explain the scope of work in the welding trade | <ul style="list-style-type: none"> ▪ Identify the career options within the welding trade: <ul style="list-style-type: none"> ▪ Oil and gas (camp work) ▪ Shipbuilding ▪ Structural ▪ Custom work ▪ Architectural ▪ Piping/pressure ▪ Transportation manufacturing ▪ Miscellaneous ▪ Boilermaker ▪ Technology within welding <ul style="list-style-type: none"> ▪ CNC machines ▪ Virtual welding machines ▪ Robotic welding machines |
| 2. Describe the role of a welder | <ul style="list-style-type: none"> ▪ Explain the essential skills required to become a welder ▪ Describe the different materials and processes used by a welder ▪ Describe the major steps involved in the preparation of material |
| 3. Describe the history of the welding trade | <ul style="list-style-type: none"> ▪ Describe early techniques used to join metals ▪ Describe the history of equipment: <ul style="list-style-type: none"> ▪ Equipment technology development |
| 4. Identify requirements for certification | <ul style="list-style-type: none"> ▪ Identify requirements for BC Certificate of Qualification and Interprovincial Red Seal <ul style="list-style-type: none"> ▪ Level C ▪ Level B ▪ Level A ▪ Hours and grants |



LINE H: WELDING MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
	<ul style="list-style-type: none"> Identify safety considerations 	<ul style="list-style-type: none"> Instructor led discussion on general safety in shop Lecture and PowerPoint on tool safety Demonstration of specific safety considerations with each of the major tools Discussion and demonstration of all PPE WHMIS considerations 	<ul style="list-style-type: none"> MIG welder Oxy-Acetylene set Plasma torch Grinders Portable power tools Hand tools Appropriate PPE for all tools Face shield, welding goggles and helmet, hearing protection 	<ul style="list-style-type: none"> Cotton coveralls CSA leather footwear CSA safety glasses Shop orientation Students to complete oxy-acetylene safety test (practical)



LINE H: WELDING MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
	<p>Practice project</p> <p>The intent of this practice project is to develop the skills required to build a final project</p> <p>See figures 1 & 2 below:</p>	<p>Students complete practice project which demonstrates skills in:</p> <ul style="list-style-type: none"> Oxy-acetylene cutting: straight, bevel, piercing Plasma cutting: straight MIG welding: Butt joint, T-joint, lap joint, vertical Grinding 	<ul style="list-style-type: none"> General shop equipment ¼" x 6" flatbar: 2' per student for practice cutting & welding and to complete the practice project 	<ul style="list-style-type: none"> Personal and shop PPE CSA-approved steel-toe leather boots CSA-approved safety glasses Hearing protection Leather gloves Cotton coveralls Welding helmet Gas welding goggles <p>Students to complete oxy-acetylene safety test (practical)</p>

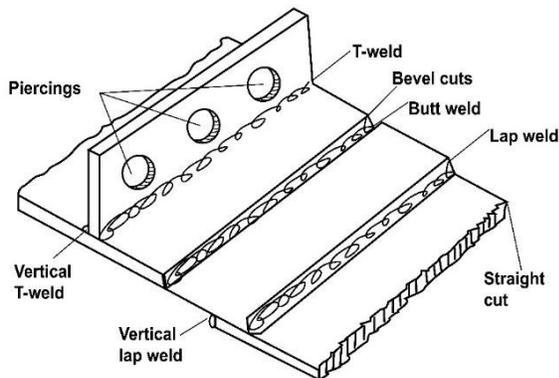


Figure 1: Practice project covering various welds and cuts.

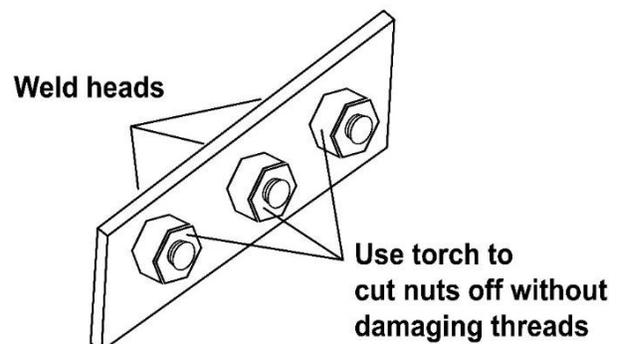


Figure 2: Practice project to develop torch skills



LINE H: WELDING MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
1 ½ days	Main project <ul style="list-style-type: none"> Identify materials needed 	<ul style="list-style-type: none"> Use drawings to identify dimension of the components of the project Gather and cut material to correct sizes 	<ul style="list-style-type: none"> Measuring tools Cutting tools 	<ul style="list-style-type: none"> Personal and shop PPE
2 Days	<ul style="list-style-type: none"> Complete project 	<ul style="list-style-type: none"> Students to complete their chosen project using the skills that they have gained through the practice project 	<ul style="list-style-type: none"> Shop and general equipment MIG welder Oxy-acetylene torch Cutting tools Layout tools Drill & drill bits Grinders 	<ul style="list-style-type: none"> Personal and shop PPE
5 Days	<ul style="list-style-type: none"> Identify skills required 	<ul style="list-style-type: none"> Discuss what skills will be needed in order to complete project Demonstration and instruction on use of all tools and equipment Students to complete practice projects using all major equipment (cutting, welding, grinding) *see practice project 	<ul style="list-style-type: none"> Shop equipment for welding and cutting Flatbar for practice projects 	<ul style="list-style-type: none"> Student PPE Welding cutting and grinding PPE Essential skills: <ul style="list-style-type: none"> Communication Document reading Numeracy



LINE H: WELDING MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
1 Hr.	<ul style="list-style-type: none"> Identify tools 	<ul style="list-style-type: none"> Students to identify which tools they will need to complete their project, and ensure that they feel competent using the 		Essential skills: <ul style="list-style-type: none"> Communication
3 to 4 Hrs.	<ul style="list-style-type: none"> Choose project 	<ul style="list-style-type: none"> Students to choose a project from samples provided or one of their own with instructors approval Discussion of why one would choose a certain project (time required, cost, tools and skills) Brainstorm possible projects 	<ul style="list-style-type: none"> Project examples Internet access Paper and pens for brain storming 	<ul style="list-style-type: none"> None Essential skills: <ul style="list-style-type: none"> Communication
3 to 4 Hrs.	<ul style="list-style-type: none"> Identify safety considerations 	<ul style="list-style-type: none"> Instructor led discussion on general safety in shop Lecture and PowerPoint on tool safety Demonstration of specific safety considerations with each of the major tools Discussion and demonstration of all PPE WHMIS considerations 	<ul style="list-style-type: none"> MIG welder Oxy-Acetylene set Plasma torch Grinders Portable power tools Hand tools Appropriate PPE for all tools Face shield, welding goggles and helmet, hearing protection 	<ul style="list-style-type: none"> Cotton coveralls CSA-approved steel-toe leather boots CSA-approved safety glasses Shop orientation Students to complete oxy-acetylene safety test (practical)



LINE I: METAL FABRICATION MODULE

In this module students are introduced to the metal fabrication trade and its various career options. Students will turn raw steel into 3-D projects using tools and materials in a safe and efficient way.

Learning Outcomes:

At the end of this module, students will be able to:

1. Describe the metal fabrication trade and associated careers.
 - a. Describe the scope of work and the role of a metal fabricator.
 - b. Describe the history and culture of the metal fabrication trade.
2. Describe and use safe shop practices and control hazards in a metal fabrication shop.
 - a. Follow emergency procedures and protocols in the metal fabrication shop.
 - b. Use personal protective equipment (PPE) appropriate to the metal fabrication shop.
 - c. Identify hazards and apply the appropriate control measure.
3. Use hand and power tools, and stationary equipment common to metal fabrication.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of common metal fabrication tools and equipment.
4. Fabricate projects using appropriate materials, tools, equipment, and safety procedures.
 - a. Select the material appropriate to the project.
 - b. Interpret shop drawings and follow verbal instructions to plan, measure and lay out projects.
 - c. Select and use the tools and equipment appropriate to the project.
 - d. Construct and assemble projects using safe practices and procedures.

Competency I1	Describe the metal fabrication trades
Competency I2	Use safe work practices in the metal fabrication trade
Competency I3	Use metal fabrication trade tools and equipment
Competency I4	Complete metal fabrication projects



Competency I1: Describe the Metal Fabrication Trade and Associated Careers

Brief Description

Students will be introduced to metal fabrication and shown what essential skills are necessary to be successful in the trade. Students will also be introduced to various types of employment, skills, technology and duties of a sheet metal fabricator.

Learning Tasks & Content

- | | |
|--|--|
| <p>1. Explain the scope of the metal fabrication trade</p> | <ul style="list-style-type: none"> ▪ Identify the career options within the metal fabrication trade <ul style="list-style-type: none"> ▪ Structural ▪ Boatbuilding ▪ Shipyard ▪ ironwork ▪ Technology within metal fabrication <ul style="list-style-type: none"> ▪ CNC machines: <ul style="list-style-type: none"> ▪ - Plasma ▪ - Laser ▪ - Water Jet |
| <p>2. Describe the role of a metal Fabricator</p> | <ul style="list-style-type: none"> ▪ Explain the essential skills required to become a metal fabricator ▪ Describe the major steps involved in the layout and preparation of material ▪ Describe the major processes involved in shop forming of sheets, plates and extruded shapes |
| <p>3. Describe the history of metal fabrication</p> | <ul style="list-style-type: none"> ▪ Describe early techniques used to sever, form and join metals ▪ Describe the history of metallurgy: <ul style="list-style-type: none"> ▪ Metals technology development ▪ History of metal work |
| <p>4. Identify requirements for certification</p> | <ul style="list-style-type: none"> ▪ Identify requirements for BC Certificate of Qualification and Interprovincial Red Seal ▪ Foundation program |



Competency I2: Use Safe Work Practices in a Metal Fabrication Shop

Brief Description

Safety is always the first concern in a metal fabrication shop. Students will learn the safety procedures for a metal fabrication shop including emergency and non-emergency, and short- and long-term hazards. Students will learn different control measures to minimize or eliminate these risks.

Learning Tasks & Content

- | | |
|---|--|
| 1. Demonstrate emergency and non-emergency procedures in the metal fabrication shop | Identify where the following are located: <ul style="list-style-type: none">▪ Emergency shutoffs▪ Fire control systems▪ Eye wash facilities▪ Emergency exits▪ Emergency contact/phone numbers▪ Outside meeting place▪ Disaster meeting place▪ First aid facilities |
| 2. Describe and use PPE in the metal fabrication shop | Explain why the following PPE are required: <ul style="list-style-type: none">▪ Steel-toe boots▪ Safety glasses▪ Hearing protection▪ Long sleeved shirts and pants Identify where and when PPE should be used: <ul style="list-style-type: none">▪ Mandatory use▪ No gloves around certain equipment▪ Drilling and grinding▪ Hammering▪ Welding |



Learning Tasks & Content

- | | |
|---|---|
| 3. Describe short-term hazards in the metal fabrication industry and apply good work habits to minimize them. | Identify and explain the hazards with the following: <ul style="list-style-type: none">▪ Sharp objects▪ Lifting/material handling▪ Personal apparel<ul style="list-style-type: none">▪ Clothing▪ Hair and beards▪ Jewellery▪ Housekeeping▪ Clear head▪ Horseplay▪ Respect for others safety▪ Constant awareness of surroundings and Distractions▪ Safe attitude▪ Management of hazards |
| 4. Describe long-term hazards in the metal fabrication industry and apply good work habits to minimize them. | Identify and explain the following hazards: <ul style="list-style-type: none">▪ Respiratory disease▪ Asbestos▪ Repetitive strain injuries▪ Management of hazards |



Competency I3: Use Metal Fabrication Tools and Equipment

Brief Description

Students will be introduced to the most common tools used in the metal fabrication trade. The student will learn how to select and identify the proper tool for the job, as well as the safe operation of it.

Learning Tasks & Content

- | | |
|--|--|
| 1. Describe metal fabrication hand tools | <ul style="list-style-type: none">▪ Hammers▪ Marking devises▪ Chisels▪ Clamps▪ Punches▪ Dividers and trammel points▪ Squares▪ Angle finders▪ Snips/cutting tools |
| 2. Identify and describe metal fabrication power tools | <ul style="list-style-type: none">▪ Grinders▪ Drills▪ Air nibbler |
| 3. Describe metal fabrication shop equipment | <ul style="list-style-type: none">▪ Iron worker▪ Drill press▪ Belt sander▪ Abrasive cut-off saw▪ Hydraulic presses▪ Brake▪ Shear |
| 4. Use metal fabrication tools and shop equipment | <ul style="list-style-type: none">▪ Types▪ Purpose/uses▪ Procedures/operations▪ Capacities▪ Safety▪ Inspection▪ adjustments |



Competency I4: Complete Metal Fabrication Projects

Brief Description

Students will complete metal fabrication projects using appropriate practices, material, tools and equipment.

Learning Tasks & Content

Complete metal fabrication projects using appropriate materials, tools, equipment, and safety procedures.

- Select the material appropriate to the project
 - Interpret shop drawings and follow verbal instructions to plan, measure and lay out projects
 - Select and use the tools and equipment appropriate to the project
 - Construct and assemble projects using safe practices and procedures
-



LINE J: CARPENTRY MODULE

In this module students are introduced to the carpentry trade and its various career options including residential, commercial and renovation construction. Students will demonstrate material and tool selection and usage, standard building techniques, and develop skills to create 3-D objects from 2-D plans and blueprints.

Learning Outcomes:

At the end of this module, students will be able to:

1. Describe the carpentry trade and associated careers.
 - a. Describe the scope of work and the role of a carpenter.
 - b. Describe the history and culture of the carpentry trade.
2. Describe and use safe shop practices and control carpentry-related hazards.
 - a. Follow carpentry shop emergency procedures and protocols.
 - b. Use personal protective equipment (PPE) appropriate to carpentry and construction.
 - c. Identify hazards and apply appropriate control measures.
3. Use hand, power, and stationary tools and equipment common to carpentry.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of common carpentry tools and equipment.
4. Identify and describe construction materials and systems.
 - a. Identify and describe framing systems.
 - b. Identify and describe framing members.
 - c. Identify and describe lumber and panel types.
 - d. Identify and select fasteners used in frame construction.
5. Construct carpentry projects using appropriate materials, tools, equipment, and safety procedures.
 - a. Select materials and fasteners appropriate to the project.
 - b. Interpret blueprints and plans to measure and lay out projects and their components.
 - c. Select and use the tools and equipment appropriate to the project.
 - d. Construct projects using safe practices and procedures.

Competency J1	Describe the carpentry trade and associated careers
---------------	---



Competency J1: Describe the carpentry trade and associated careers

Brief Description

Students will be introduced to the carpentry trade and shown the skills that are essential to begin a career in that trade. The various career paths and aspects of the carpentry trade will also be explained. In addition, students will be introduced to the general materials and processes used by a carpenter.

Learning Tasks & Content

- | | |
|---|---|
| 1. Explain the scope of the carpentry trade | <ul style="list-style-type: none">Identify different aspects of the carpentry tradeDescribe the major steps involved in the planning and layout of various carpentry projectsDescribe the major processes involved in the construction of various carpentry projects |
| 2. Describe relevant cost considerations on various construction projects | <ul style="list-style-type: none">Explain the cost considerations with different materialsDescribe the importance of wages per hours and labour costsExplain the importance of keeping the work site/shop clean and maintainedDescribe how quality of work can affect cost |
| 3. Describe the history of the carpentry trade and identify requirements for certification | <ul style="list-style-type: none">Describe early techniques used to construct projectsDescribe the history of carpentry apprenticeshipIdentify requirements for BC Certificate of Qualification and Interprovincial Red Seal |
| 4. Explain standard carpentry and construction project administration and its relevance to a carpentry apprentice | <ul style="list-style-type: none">Identify the following:<ul style="list-style-type: none">Project ManagerSuperintendentSupervisor/ForemanCertified TradespersonApprenticeShop StewardHealth and Safety Committee |



LINE J: CARPENTRY MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
*All times include lecture and shop work Day 1 <ul style="list-style-type: none"> Classroom 	<ul style="list-style-type: none"> Design the project <ul style="list-style-type: none"> Build a set of stairs 	<ul style="list-style-type: none"> Choose size, shape and overall appearance of project Using drawing tools draft the project to scale 	<ul style="list-style-type: none"> Paper T-square Set squares Pencils Scale rule 	<ul style="list-style-type: none"> N/A
Day 2 <ul style="list-style-type: none"> Shop 	<ul style="list-style-type: none"> Layout the project 	<ul style="list-style-type: none"> Create a material list for the project Select a work space & tools Begin full scale layout 	<ul style="list-style-type: none"> Tape measure/pencil Materials list sheet Chalk line Straight edge Level/plumb bob Drawings 	<ul style="list-style-type: none"> Hard hat Steel-toe boots Safety glasses Hearing protection
Day 3 <ul style="list-style-type: none"> Shop 	<ul style="list-style-type: none"> Structural framing 	<ul style="list-style-type: none"> Frame <ul style="list-style-type: none"> Wall Floor Landing components as required Apply BC building code 	<ul style="list-style-type: none"> Hammer/nails Screw/drivers Bolts as required Glue Saw Framing square 	<ul style="list-style-type: none"> Hard hat Steel-toe boots Safety glasses Hearing protection Push stick/blade guard Instruction on all tools
Days 4–5 <ul style="list-style-type: none"> Shop 	<ul style="list-style-type: none"> Pre-fabricate stair components 	<ul style="list-style-type: none"> Use appropriate tools to produce all stair components 	<ul style="list-style-type: none"> Table saw Measuring tools Hand saw/mitre saw Sander Router Drill press Band saw Jointer Thickness planer 	<ul style="list-style-type: none"> Hard hat Steel-toe boots Safety glasses Hearing protection Dust mask



LINE J: CARPENTRY MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Days 6–7 <ul style="list-style-type: none"> ▪ Shop 	<ul style="list-style-type: none"> ▪ Assembly of stair components 	<ul style="list-style-type: none"> ▪ Assemble all stair components 	<ul style="list-style-type: none"> ▪ Nails ▪ Screws ▪ Bolts ▪ Glue ▪ Clamps ▪ Drill & bits 	<ul style="list-style-type: none"> ▪ Hard hat ▪ Steel-toe boots ▪ Safety glasses ▪ Hearing protection
Day 8 <ul style="list-style-type: none"> ▪ Shop 	<ul style="list-style-type: none"> ▪ Final finishing 	<ul style="list-style-type: none"> ▪ Set nails ▪ Dowel screw holes ▪ Fill holes ▪ Sand and finish as required 	<ul style="list-style-type: none"> ▪ Nail set ▪ Dowel and saw ▪ Filler ▪ Hand sander ▪ Orbital sander 	<ul style="list-style-type: none"> ▪ Hard hat ▪ Steel-toe boots ▪ Safety glasses ▪ Hearing protection ▪ Dust mask



LINE K: ELECTRICAL MODULE

In this module students are introduced to the electrical trade and its various career options including construction and industrial electrician. Students will work safely following electrical code requirements to select appropriate materials and tools to perform tasks.

Learning Outcomes

At the end of this module, students will be able to:

1. Describe the electrical trade and associated careers.
 - a. Describe the scope of work and the role of an electrician.
 - b. Describe the history and culture of the electrical trade.
2. Describe and use safe shop practices and control hazards in the electrical trade
 - a. Follow emergency procedures and protocols.
 - b. Use personal protective equipment (PPE) appropriate to the electrical trade.
 - c. Identify hazards and apply the appropriate control measure.
3. Use hand and power tools, and stationary equipment common to the electrical trade.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of common electrical trade tools and equipment.
4. Complete projects and tasks using appropriate materials, tools, equipment, and safety procedures.
 - a. Select the material appropriate to the project.
 - b. Interpret shop drawings and follow verbal instructions to plan, measure and lay out projects.
 - c. Select and use the tools and equipment appropriate to the project.
 - d. Construct and assemble projects using safe practices and procedures.

Competency K1	Describe the electrical trade
---------------	-------------------------------



Competency K1: Describe the Electrical Trade

Brief Description

Students will be introduced to the electrical trade and shown what skills are essential to begin a career in the trade. Students will also be introduced to various materials and processes used by an electrician.

Learning Tasks & Content

- | | |
|---|--|
| 1. Explain the scope of the electrical trades | <ul style="list-style-type: none">Identify the career options within the electrical trade<ul style="list-style-type: none">ConstructionIndustrialTechnology within the electrician trade<ul style="list-style-type: none">Computer controlsDiagnostic equipmentLow voltage systems |
| 2. Describe the role of an electrician | <ul style="list-style-type: none">Explain essential skillsBC Electrical Code<ul style="list-style-type: none">Role of an electricianRequirements of codeDescribe the major steps involved in the layout and preparation of an installationExplain the types of work an electrician does on a work site<ul style="list-style-type: none">New installationMaintenanceRepairsDiagnostics |
| 3. Identify requirements for certification | <ul style="list-style-type: none">Identify the requirements for BC certificate of qualification and interprovincial red sealFoundation programBC Safety Council<ul style="list-style-type: none">Electrical permits |



LINE K: ELECTRICAL MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Day 1 <ul style="list-style-type: none"> 2 hours Including discussion and instruction on proper tool/wire handling 	<ul style="list-style-type: none"> Make extension cord with only male cord end 	<ul style="list-style-type: none"> Cut 2' length of ST 14/3 cable Attach male cord end 	Materials: <ul style="list-style-type: none"> 2' SJ 14/3 cable Male 15A, 120V cord end Tools: <ul style="list-style-type: none"> Knife Wire strippers Phillips screwdriver and or #6 Robertson screwdriver 	<ul style="list-style-type: none"> Safety glasses
Day 1 <ul style="list-style-type: none"> 1 hour Including discussion on heights, drywall thickness, different boxes, IC/non IC, screws proper screw-drivers Optional – discuss circuitry here to complete the day	<ul style="list-style-type: none"> Layout circuit If there is time, can make blueprint layout In shop <ul style="list-style-type: none"> Layout location of switches, plugs, lights, fan etc. 	<ul style="list-style-type: none"> Layout circuit Device box locations 	<ul style="list-style-type: none"> Sharpie Pencil Chalk (to write on studs, joist or floor) Measuring tape Ladder 	<ul style="list-style-type: none"> Safety glasses CSA-approved steel-toe boots with green Δ and orange Ω



LINE K: ELECTRICAL MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Day 2 <ul style="list-style-type: none"> 2 hours 	<ul style="list-style-type: none"> Install boxes 	<ul style="list-style-type: none"> Put up blocking if necessary Install all boxes necessary for circuit 	Materials: <ul style="list-style-type: none"> Scrap 2 x 4 or 2 x 6 for blocking Spikes or nails for 2" #8 wood screws 1" #8 wood screws Metal and or plastic boxes with vapour barrier/foam gasket Optional bathroom fan Vapour boot or barrier Tools: <ul style="list-style-type: none"> Ladders Hammer #8 Robertson screwdriver 	<ul style="list-style-type: none"> Glasses CSA-approved steel-toe Safety boots with green Δ and orange Ω Ladder safety
Day 2 <ul style="list-style-type: none"> 1 hour Could include tool safety demo 	<ul style="list-style-type: none"> Drill holes 	<ul style="list-style-type: none"> Drill all holes needed to run wires to complete circuit 	Materials: Tools: <ul style="list-style-type: none"> Power drill & auger bit Cordless drill & spade bit 	<ul style="list-style-type: none"> Safety glasses CSA-approved steel-toe boots with green Δ and orange Ω Ladder safety Hearing protection No hoodies or clothing with hanging material Power drill safety



LINE K: ELECTRICAL MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
<p>Day 2</p> <ul style="list-style-type: none"> 3 hours depending on size of circuit (could be longer) Take time for proper wire handling techniques CEL Tool use safety demo of hand tools 	<ul style="list-style-type: none"> Run wires to boxes 	<ul style="list-style-type: none"> Attach cord end as home run Run all wires necessary to make circuit work as per CEL 	<p>Materials:</p> <ul style="list-style-type: none"> 14/2, 14/3 Loomex Staples Loomex ½” connectors if needed <p>Tools:</p> <ul style="list-style-type: none"> Hammer Cutting tool Linesman pliers Wire strippers Diagonal pliers 	<ul style="list-style-type: none"> Safety glasses CSA-approved steel-toe boots with green Δ and orange Ω Ladder safety Hearing protection No hoodies or clothing with hanging material Power drill safety
<p>Days 2–3</p> <ul style="list-style-type: none"> Discussion on circuitry – refresher 	<ul style="list-style-type: none"> Splice boxes 	<ul style="list-style-type: none"> Start at 1 box, strip, put all wires into box Bond box Splice Carry on to next box 	<p>Materials:</p> <ul style="list-style-type: none"> Marrets <p>Tools:</p> <ul style="list-style-type: none"> Hammer Cutting tool #8 red Robertson screwdriver Linesman pliers Wire strippers Diagonal plier 	<ul style="list-style-type: none"> Safety glasses CSA-approved steel-toe boots with green Δ and orange Ω Ladder safety Hearing protection No hoodies or clothing with hanging material Power drill safety



LINE K: ELECTRICAL MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Days 3–4 <ul style="list-style-type: none"> 4 hours Depends on how complicated project is 	<ul style="list-style-type: none"> Finish 	<ul style="list-style-type: none"> Start at 1 box Attach all devices necessary Attach device to boxes 	Materials: <ul style="list-style-type: none"> Plugs Switches (S.P., 3 way, 4 way) Dimmers Fan, motor, grill Marrets Tools: <ul style="list-style-type: none"> #6 green Robertson screwdriver Wire strippers 	<ul style="list-style-type: none"> Safety glasses CSA-approved steel-toe boots with green Δ and orange Ω Ladder safety Hearing protection No hoodies or clothing with hanging material Power drill safety
Day 4 <ul style="list-style-type: none"> 1 hour Discussion on meters 	<ul style="list-style-type: none"> Energize circuit 	<ul style="list-style-type: none"> Attach each student's project individually to shop power Test all loads Use meter for plugs, circuit analyzer 	Materials: <ul style="list-style-type: none"> Full extension cord 120V/15A energized receptacle Tools: <ul style="list-style-type: none"> #6 green Robertson screwdriver #8 red Robertson screwdriver Wire strippers Knife Phillips Circuit analyzer tester DVOM 	<ul style="list-style-type: none"> Safety glasses CSA-approved steel-toe boots with green Δ and orange Ω Ladder safety Hearing protection No hoodies or clothing with hanging material Power drill safety



CARPENTRY / ELECTRICAL / PLUMBING				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Day 1 <ul style="list-style-type: none"> 6 hours 	<ul style="list-style-type: none"> Shop safety Measuring tools 	<ul style="list-style-type: none"> Shop orientation First aid location Fire extinguisher location and types MSDS location Fire pulls Muster location 	<ul style="list-style-type: none"> Video (shop safety) 	<ul style="list-style-type: none"> PPE, ear, eyes, foot, head, clothing
Day 2 <ul style="list-style-type: none"> 6 hours 	<ul style="list-style-type: none"> Hand tools Hand saw Mitre box 	<ul style="list-style-type: none"> Safe working procedures Saw practical 90°, 45° cutting Reading detailed plan Cut and assemble 	<ul style="list-style-type: none"> Hand saw 2 x 4's ¾" plywood Fasters Drill 	<ul style="list-style-type: none"> CSA-approved steel-toe boots CSA safety glasses
Day 3 <ul style="list-style-type: none"> 6 hours 	<ul style="list-style-type: none"> Power tools Drills Compound mitre saw Fasteners Build pony wall 	<ul style="list-style-type: none"> Safe working procedures Compound saw practical Mitre, bevel compound cuts Identify framing member Measuring length of material Layout plates assemble 	<ul style="list-style-type: none"> mitre saw drills 2 x 4 3" fasteners 	<ul style="list-style-type: none"> Video Shop demo CSA-approved steel-toe boots CSA safety glasses



CARPENTRY / ELECTRICAL / PLUMBING				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Days 4 & 5 <ul style="list-style-type: none"> ▪ 12 hours 	<ul style="list-style-type: none"> ▪ Floor framing ▪ Attach to pony walls 	<ul style="list-style-type: none"> ▪ Identify framing member ▪ Layout ▪ Assemble ▪ Toe nail ▪ 45° bracing ▪ Plywood gussets ▪ Squaring ▪ sheathing 	<ul style="list-style-type: none"> ▪ 3-4-5 rule 	<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses
Day 6 <ul style="list-style-type: none"> ▪ 6 hours 	Circular saw <ul style="list-style-type: none"> ▪ Stairs 	<ul style="list-style-type: none"> ▪ Safe work procedures ▪ Practical (bevel, mitre, compound) ▪ Rise and run ▪ Total rise 	<ul style="list-style-type: none"> ▪ Circular saw ▪ Framing square 	<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses
Days 7, 8 & 9 <ul style="list-style-type: none"> ▪ 18 hours 	Wall <ul style="list-style-type: none"> ▪ Reading plans ▪ Squaring ▪ Erect walls 	<ul style="list-style-type: none"> ▪ Identify framing member ▪ Measure and assemble ▪ Diagonal measure <ul style="list-style-type: none"> ▪ Sheet ▪ Stand and brace 		<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses
Day 10 <ul style="list-style-type: none"> ▪ 6 hours 	<ul style="list-style-type: none"> ▪ Working from heights ▪ Ceiling framing 	<ul style="list-style-type: none"> ▪ Ladder safety procedures ▪ Layout ▪ Assemble ▪ Attach 		<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses ▪ Ladder safety procedures ▪ Hard hat



CARPENTRY / ELECTRICAL / PLUMBING				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Days 11–12 ▪ 12 hours	<ul style="list-style-type: none"> ▪ Drainage & venting ▪ Measuring ▪ Slope ▪ Bathtub installation 	<ul style="list-style-type: none"> ▪ Identify types of pipes ▪ On-centre measure ▪ Per foot ▪ Backing & rough opening 	<ul style="list-style-type: none"> ▪ Mitre box ▪ Reciprocating saw 	<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses
Day 13 ▪ 6 hours	<ul style="list-style-type: none"> ▪ Supply lines ▪ Boring or notching ▪ Rough in lines 	<ul style="list-style-type: none"> ▪ Identify types ▪ On-centre measure 	<ul style="list-style-type: none"> ▪ Drills – right angle 	<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses
Day 14 ▪ 6 hours	<ul style="list-style-type: none"> ▪ Brass fitting for fixtures ▪ Shut off valves 	<ul style="list-style-type: none"> ▪ Fixture location ▪ On-centre 	<ul style="list-style-type: none"> ▪ Crimping tool ▪ Pex piping 	<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses
Days 15–16 ▪ 12 hours	<ul style="list-style-type: none"> ▪ Sink and counter installation ▪ Fixture installation 	<ul style="list-style-type: none"> ▪ Height location ▪ Shower <ul style="list-style-type: none"> ▪ Faucet ▪ Tub spout ▪ Toilet <ul style="list-style-type: none"> ▪ Wax ring ▪ Supply line ▪ Sink <ul style="list-style-type: none"> ▪ Supply lines 	<ul style="list-style-type: none"> ▪ 2 x 4 ▪ ¾" plywood 	<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses
Days 17–18 ▪ 12 hours	<ul style="list-style-type: none"> ▪ Electrical safety 	<ul style="list-style-type: none"> ▪ How electricity works ▪ How electricity flows ▪ Receptacle fixture locations ▪ Drilling locations 		<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses
Days 19–20 ▪ 12 hours	<ul style="list-style-type: none"> ▪ Rough in wires ▪ Splicing ▪ Pigtail 	<ul style="list-style-type: none"> ▪ Pull wire through fixtures locations 	<ul style="list-style-type: none"> ▪ Right angle drill ▪ Wire stripper ▪ Olfa knives 	<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses



CARPENTRY / ELECTRICAL / PLUMBING				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Days 21–22	<ul style="list-style-type: none"> ▪ Switch and fixture finish ▪ Plug install for power source ▪ Test plumbing and electrical 			<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses
Days 23–24 <ul style="list-style-type: none"> ▪ 12 hours 	<ul style="list-style-type: none"> ▪ Dismantle project 			<ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ CSA safety glasses



LINE L: AUTOMOTIVE SERVICE

In this module students are introduced to the automotive service industry. They will learn about the various career options within the trade and will complete automotive service and repair tasks using industry standard equipment and tooling.

Learning Outcomes

At the end of this module, students will be able to:

1. Describe the automotive industry and associated careers.
 - a. Describe the scope of work and the role of an automotive service technician.
 - b. Describe the history and culture of the automotive trade.
2. Describe and use safe shop practices and control hazards in an automotive shop
 - a. Follow shop emergency procedures and protocols.
 - b. Use personal protective equipment (PPE) appropriate to the automotive shop.
 - c. Identify hazards and apply the appropriate control measure
3. Use hand and power tools, and stationary equipment common to automotive industry.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of common automotive tools and equipment.
4. Complete automotive service and repair tasks using appropriate materials, parts, tools and equipment.
 - a. Interpret manuals to diagnose and plan the task.
 - b. Select the materials and parts appropriate to the task.
 - c. Select and use the tools and equipment appropriate to the project.
 - d. Complete the tasks using safe practices and procedures.

Competency L1	Describe the automotive trade
---------------	-------------------------------



Competency L1: Describe the Automotive Industry and Associated Careers

Brief Description

Students will be introduced to the automotive service industry and shown what skills are essential to begin a career in the trade. Students will also be introduced to various duties as an automotive technician.

Learning Tasks & Content

1. Explain the scope of the automotive service industry
 - Identify different diagnosing techniques
 - Describe the major steps involved in the disassembly of a vehicle
 - Describe the major processes involved in repair of a vehicle
2. Describe relevant cost considerations in an automotive shop
 - Explain the cost considerations with different materials
 - Describe the importance of wages per hours and labour costs
 - Explain the importance of keeping the work site/shop clean and maintained
 - Describe how quality of work can effect cost
3. Describe the history of the automotive industry and identify requirements for certification
 - Describe early techniques used to repair vehicles
 - Describe the technology advances in vehicles
 - Identify requirements for BC Certificate of Qualification and Interprovincial Red Seal



LINE L: AUTOMOTIVE SERVICE MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Day 1 <ul style="list-style-type: none"> 6 hours 	<ul style="list-style-type: none"> Engine removal 	<ul style="list-style-type: none"> Drain fluids Disconnect battery Remove hood Disconnect <ul style="list-style-type: none"> Exhaust Driveline Fuel system Electrical Engine mounts Remove engine Install on stand 	<ul style="list-style-type: none"> Scrap vehicle General hand tools Engine hoist Oxy-acetylene torch Drain pans/spill clean up Jack stands/hoist? Floor jack Air tools Access to repair manuals 	<ul style="list-style-type: none"> Proper use and required auto shop PPE Safety glasses Full face protection Coveralls CSA-approved steel-toe boots Gloves for each task Hearing protection Bending and lifting Correct engine lift points
Day 1 <ul style="list-style-type: none"> 1 hour 	<ul style="list-style-type: none"> Fluid recycling 	<ul style="list-style-type: none"> Drain fluids Store fluids into specific containers Clean work area Remove fuel tank/lines 	<ul style="list-style-type: none"> Drain pans Spill kit Oil soak pads Fire proof rag storage AC R134 machine General hand tools 	<ul style="list-style-type: none"> Proper ventilation Safe handling and storage of refrigerant and fuels WHMIS/MSDS Fire prevention



LINE L: AUTOMOTIVE SERVICE MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Day 2	<ul style="list-style-type: none"> Steering systems 	<ul style="list-style-type: none"> Remove components and identify 	<ul style="list-style-type: none"> Pitman arm puller General tools Ball joint service kit 	<ul style="list-style-type: none"> Air bag safety precautions Proper use and required auto shop PPE Safety glasses Full face protection Coveralls CSA-approved steel-toe boots Gloves for each task Hearing protection Bending and lifting
Day 3	<ul style="list-style-type: none"> Suspension Systems 	<ul style="list-style-type: none"> Remove components and identify 	<ul style="list-style-type: none"> Strut/spring compressor tool Torch General hand tools Air tools 	<ul style="list-style-type: none"> Ride height system precautions Proper use and required auto shop PPE Safety glasses Full face protection Coveralls CSA-approved steel-toe boots Gloves for each task Hearing protection Bending and lifting



LINE L: AUTOMOTIVE SERVICE MODULE				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Day 4	<ul style="list-style-type: none"> Brake System 	<ul style="list-style-type: none"> Service/clean brakes Identify worn components Measurements 	<ul style="list-style-type: none"> Brake gauges <ul style="list-style-type: none"> Disc & drum Brake lathe Floor jack or hoist Jack stands Brake cleaner 	<ul style="list-style-type: none"> Hazmat cleaner for brake dust Proper use and required auto shop PPE CSA-approved safety glasses Full face protection Coveralls CSA-approved steel-toe boots Gloves for each task Hearing protection Bending and lifting
Day 5	<ul style="list-style-type: none"> Engine Operation 	<ul style="list-style-type: none"> Remove engine components <ul style="list-style-type: none"> Intake manifold Exhaust manifold(s) Accessories Cylinder head(s) Oil pan Pistons Camshaft crankshaft 	<ul style="list-style-type: none"> General hand tools Repair manual for engine 	<ul style="list-style-type: none"> Proper use and required auto shop PPE CSA-approved safety glasses Full face protection Coveralls CSA-approved steel-toe boots Gloves for each task Hearing protection Bending and lifting



LINE M: HEAVY DUTY EQUIPMENT TECHNICIAN MODULE

In this module students are introduced to the Heavy Duty Equipment industry. They will learn about the various career options within the trade and will complete heavy duty equipment service tasks and repair procedures using industry standard equipment and tooling.

Learning Outcomes

At the end of this module, students will be able to:

1. Describe the heavy duty equipment industry and associated careers.
 - a. Describe the scope of work and the role of heavy duty equipment technician.
 - b. Describe the history and culture of the heavy duty equipment trade.
2. Describe and use safe shop practices and control hazards in a heavy duty shop
 - a. Follow shop emergency procedures and protocols.
 - b. Use personal protective equipment (PPE) appropriate to the heavy duty shop.
 - c. Identify hazards and apply the appropriate control measure
3. Use hand and power tools, and stationary equipment common to heavy duty industry.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of common heavy duty tools and equipment.
4. Complete heavy duty equipment service and repair tasks using appropriate materials, parts, tools and equipment.
 - a. Interpret manuals to diagnose and plan the task.
 - b. Select the materials and parts appropriate to the task.
 - c. Select and use the tools and equipment appropriate to the project.
 - d. Complete the tasks using safe practices and procedures.

Competency M1	Describe the heavy duty equipment industry
Competency M2	Use safe work practices in the heavy duty trade
Competency M3	Use heavy duty tools and equipment
Competency M4	Complete heavy duty equipment service tasks



Competency M1: Describe the Heavy Duty Equipment Industry

Brief Description

A Heavy Duty Equipment Technician is a tradesperson who possesses the full range of knowledge, abilities and skills required to diagnose, repair, adjust, overhaul, maintain, operate and test the mobile, heavy duty machinery used in the construction, forestry, mining, petrochemical, material handling, landscaping, land clearing, transportation, road building and farming sectors.

Learning Tasks & Content

- | | |
|--|--|
| 1. Explain the scope of the Heavy Duty Equipment trade | <ul style="list-style-type: none"> ▪ Earth moving equipment ▪ Stationary diesel engines ▪ Cranes ▪ Drilling equipment |
| 2. Types of employers | <ul style="list-style-type: none"> ▪ Contractor ▪ Manufacturer ▪ Service/maintenance facility ▪ Remote location/camps |
| 3. Describe the history of the heavy duty industry and identify requirements for certification | <ul style="list-style-type: none"> ▪ Describe early techniques used to repair equipment ▪ Describe the technology advances in heavy duty equipment ▪ Identify requirements for BC Certificate of Qualification and Interprovincial Red Seal |



Competency M2: Use Safe Work Practices in a Heavy Duty Equipment Shop

Brief Description

A safe working environment is crucial to the heavy duty industry. Students will be introduced to a variety of shop or workplace hazards typically seen in the heavy duty equipment industry. Students will learn about minimizing the risks and managing these hazards, both short- and long-term. The course will provide students with the necessary skills to handle both emergency and non-emergency situation.

Learning Tasks & Content

- | | |
|--|--|
| 1. Demonstrate emergency and non-emergency procedures | Identify where the following are located: <ul style="list-style-type: none">▪ Emergency shutoffs▪ Fire control systems▪ Eye wash facilities▪ Emergency exits▪ Emergency contact/phone numbers▪ Outside meeting place▪ Disaster meeting place▪ First aid facilities |
| 2. Describe and use PPE in the heavy duty equipment shop | Explain why the following PPE are required: <ul style="list-style-type: none">▪ Steel-toe boots▪ Safety glasses▪ Hearing protection▪ Coveralls Identify where and when PPE should be used: <ul style="list-style-type: none">▪ Mandatory use▪ Chemicals (spray cleaners)▪ Drilling and grinding▪ Hammering▪ Welding and cutting |



Learning Tasks & Content

- | | |
|--|---|
| <p>3. Describe short-term hazards in the heavy duty industry and apply good work habits to minimize them.</p> | <p>Identify and explain the hazards with the following:</p> <ul style="list-style-type: none">▪ Sharp objects▪ Lifting/material handling▪ Personal apparel<ul style="list-style-type: none">▪ Clothing▪ Hair and beards▪ Jewellery▪ Housekeeping▪ Clear head▪ Horseplay▪ Respect for others safety▪ Constant awareness of surroundings▪ Safe attitude▪ Management of hazards |
| <p>4. Describe long-term hazards in the heavy duty equipment industry and apply good work habits to minimize them.</p> | <p>Identify and explain the following hazards:</p> <ul style="list-style-type: none">▪ Respiratory disease▪ Asbestos▪ Repetitive strain injuries▪ Management of hazards |



Competency M3: Use Heavy Duty Tools and Equipment

Brief Description

Students will learn about the most common heavy duty tools and equipment used in industry. The student will learn how to select and identify the proper tool for the job, as well as the correct operation of it. The course will also teach the students to inspect and recognize when a tool or piece of equipment is in need of adjustment or replacement.

Learning Tasks & Content

1. Describe heavy duty equipment hand tools
 - Wrenches
 - Pliers
 - socket sets
 - Screwdrivers
 - Marking devices
 - Hammers
 - Punches
 - Vice grips
 - Clamps
2. Describe heavy duty shop equipment
 - Hoists/lifts
 - Air tools/compressor
 - Jacks
 - Diagnosing equipment
 - Battery chargers
 - Hydraulic press
 - Tire inflation chamber
3. Use tools and shop equipment
 - Types
 - Purpose/Uses
 - Procedures/Operations
 - Capacities
 - Safety
 - Inspection
 - adjustment



Competency M4: Complete Projects

Brief Description

Students will use the skills learned throughout the course to select the appropriate materials, tools, and equipment to complete heavy duty equipment service and repair tasks in a safe and efficient manner.

Learning Tasks & Content

1. Complete heavy duty equipment service and repair tasks
 - Select the material appropriate to the project
 - Interpret shop manuals to diagnose and plan repairs
 - Select and use the tools and equipment appropriate to the task
 - Disassemble and repair vehicles using safe practices and procedures



LINE N: MILLWRIGHT MODULE

In this module students are introduced to the millwright trade and its various career options. Millwrights install, repair, overhaul and maintain all types of machinery and heavy mechanical equipment. They work from plans and blueprints and install equipment and align parts or components. Millwrights also maintain and repair machinery as required. They learn how to use grinders and lathes so they can make their own parts if necessary. Maintenance includes cleaning and lubricating, or adjusting valves and seals. They must inspect and examine the equipment to find and investigate problems and breakdowns.

Learning Outcomes

At the end of this module, students will be able to:

1. Describe the millwright trade and associated careers.
 - a. Describe the scope of work and the role of a millwright.
2. Describe and use safe shop practices and control hazards in a millwright shop.
 - a. Follow emergency procedures and protocols in the millwright shop.
 - b. Use personal protective equipment (PPE) appropriate to the millwright shop.
 - c. Identify hazards and apply the appropriate control measure.
3. Use hand and power tools, and stationary equipment common to millwright.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of common millwright fabrication tools and equipment.
4. Fabricate projects using appropriate materials, tools, equipment, and safety procedures.
 - a. Select the material appropriate to the project.
 - b. Interpret shop drawings and follow verbal instructions to plan, measure and lay out projects.
 - c. Select and use the tools and equipment appropriate to the project.
 - d. Construct and assemble projects using safe practices and procedures.

Competency N1	Describe the Millwright Trade
---------------	-------------------------------



Competency N1: Describe the Millwright Trade and Associated Careers

Brief Description

Students will be introduced to millwright trade and shown what essential skills are necessary to be successful in the trade. Students will also be introduced to various abilities, skills and knowledge that are required to be a millwright.

Learning Tasks & Content

- | | |
|---|---|
| <p>1. Explain the scope of the millwright trade</p> | <ul style="list-style-type: none"> ▪ Identify the career options within the millwright trade <ul style="list-style-type: none"> ▪ Construction millwright ▪ Industrial technician ▪ Pulp and paper ▪ Forestry ▪ Manufacturing ▪ Technology within millwright <ul style="list-style-type: none"> ▪ Pneumatic systems ▪ Computer controls ▪ Hydraulic systems ▪ Automation |
| <p>2. Describe the role of a millwright</p> | <ul style="list-style-type: none"> ▪ Explain the essential skills required to become a millwright ▪ Identify the daily tasks of a millwright ▪ Identify the types of equipment that is worked on by a millwright |
| <p>3. Identify requirements for certification</p> | <ul style="list-style-type: none"> ▪ Identify requirements for BC Certificate of Qualification and Interprovincial Red Seal ▪ Foundation program |



LINE N: MILLWRIGHT				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Day 1 <ul style="list-style-type: none"> 2.5 hours Project will be to do a “simple machine” presentation. Students will research and make a simple machine	<ul style="list-style-type: none"> Introduction to simple machines <ul style="list-style-type: none"> Group work Learning styles Assign groups & machines 	<ul style="list-style-type: none"> Introduce simple machines Introduce effective team work Learning styles 	<ul style="list-style-type: none"> Classroom Presentation materials 	<ul style="list-style-type: none"> N/A
Day 1 <ul style="list-style-type: none"> 3 hours 	<ul style="list-style-type: none"> Research 	<ul style="list-style-type: none"> Students decide rules and tasks Project scope Assess – can we do this in X many hours? 	<ul style="list-style-type: none"> Computers Books Instructor hand outs 	<ul style="list-style-type: none"> N/A
Day 2 <ul style="list-style-type: none"> 1 hour 	<ul style="list-style-type: none"> Scavenger hunt 	<ul style="list-style-type: none"> Find resources to build “simple machine” Plan List 	<ul style="list-style-type: none"> Scrap metal Scrap gears Assorted hardware Rope String Chain 	<ul style="list-style-type: none"> General shop knowledge Basic shop required PPE <ul style="list-style-type: none"> CSA-approved steel-toe boots Safety glasses Work wear
Day 2 <ul style="list-style-type: none"> 2 hours 	<ul style="list-style-type: none"> Build Compose Present 	<ul style="list-style-type: none"> Instructor to approve plan (advise) <ul style="list-style-type: none"> Source Plan tools Equipment Build 	<ul style="list-style-type: none"> Access to millwright shop Hand power tools Shop equipment (will depend on project) 	<ul style="list-style-type: none"> General shop knowledge Basic shop required PPE <ul style="list-style-type: none"> CSA-approved steel-toe boots Safety glasses Work wear



LINE N: MILLWRIGHT				
TIME FRAME	MAJOR TASKS	STEPS	MATERIALS, TOOLS, EQUIPMENT	SAFETY
<i>How many hours/days needed?</i>	<i>What are the major tasks for the project?</i>	<i>What are the steps within the task?</i>	<i>What materials, tools, and equipment are needed?</i>	<i>What PPE and safety knowledge do students need?</i>
Day 2 <ul style="list-style-type: none"> ▪ 2 hours 	<ul style="list-style-type: none"> ▪ Presentations ▪ 6 simple machines x 10 minutes 	<ul style="list-style-type: none"> ▪ Prepare ▪ Present ▪ Questions/ Answers 	<ul style="list-style-type: none"> ▪ Classroom ▪ Student projects 	<ul style="list-style-type: none"> ▪ N/A
Day 2 <ul style="list-style-type: none"> ▪ 2 hours 	<ul style="list-style-type: none"> ▪ Reflect ▪ Shop tour to identify simple machines found in the workshop machinery/equipment 	<ul style="list-style-type: none"> ▪ Reflection ▪ Presentation <ul style="list-style-type: none"> ▪ Team ▪ Learn ▪ Tour to identify machines complex mechanical systems 	<ul style="list-style-type: none"> ▪ Classroom ▪ Shop resources <ul style="list-style-type: none"> ▪ Pumps ▪ Conveyors ▪ Gears 	<ul style="list-style-type: none"> ▪ General shop knowledge ▪ Basic shop required PPE <ul style="list-style-type: none"> ▪ CSA-approved steel-toe boots ▪ Safety glasses ▪ Work wear



LINE O: MACHINIST MODULE

In this module students are introduced to the machinist trade and its various career options. Machinists turn blocks of metal into complex, intricate metal parts for other products. They also fit and assemble metal parts and sub-assemblies, ensuring the parts in these products meet exacting standards in size, strength and hardness. Machinists set up and operate lathes, milling machine saws, grinding machines, drilling and boring machines, shapers, planers, precision measuring tools, hand and power tools, and the related attachments and accessories including cutting tools

Learning Outcomes

At the end of this module, students will be able to:

1. Describe the machinist trade and associated careers.
 - a. Describe the scope of work and the role of a machinist
2. Describe and use safe shop practices and control hazards in a machine shop.
 - a. Follow emergency procedures and protocols in the machine shop.
 - b. Use personal protective equipment (PPE) appropriate to the machine shop.
 - c. Identify hazards and apply the appropriate control measure.
3. Use hand and power tools, and stationary equipment common to machine shop.
 - a. Identify and describe the function and purpose of select tools and equipment.
 - b. Demonstrate the safe and appropriate use of common machinist fabrication tools and equipment.
4. Fabricate projects using appropriate materials, tools, equipment, and safety procedures.
 - a. Select the material appropriate to the project.
 - b. Interpret shop drawings and follow verbal instructions to plan, measure and lay out projects.
 - c. Select and use the tools and equipment appropriate to the project.
 - d. Construct and assemble projects using safe practices and procedures.

Competency O1	Describe the machinist trade
Competency O2	Use safe work practices in the machinist trade
Competency O3	Use machinist trade tools and equipment
Competency O4	Complete machinist projects



Competency O1: Describe the Machinist Trade and Associated Careers

Brief Description

Students will be introduced to the machinist trade and shown what essential skills are necessary to be successful in the trade. Students will also be introduced to various abilities, skills and knowledge that are required to be a machinist.

Learning Tasks & Content

- | | |
|---|--|
| 1. Explain the scope of the machinist trade | <ul style="list-style-type: none">Identify the career options within the machinist trade<ul style="list-style-type: none">Machine shopManufacturingAerospace IndustryAutomobile/Motorcycle IndustryMedical Research IndustryInnovative Technologies IndustryResearch and Development IndustryForestry and Mining IndustryManufacturing Machine Parts IndustryTechnology within machining<ul style="list-style-type: none">Computer Numeric Control (CNC) machinesComputer Aided Manufacturing (CAM) software |
| 2. Describe the role of a machinist | <ul style="list-style-type: none">Explain the essential skills required to become a machinistIdentify the daily tasks of a machinistIdentify the types of equipment that is used by a machinistIdentify the types of things a machinist would manufacture |
| 3. Identify requirements for certification | <ul style="list-style-type: none">Identify requirements for BC Certificate of Qualification and Interprovincial Red SealFoundation program |



Competency O2: Use Safe Work Practices in a Machine Shop

Brief Description

Safety is always the first concern in a machine shop. Students will learn the safety procedures for a machine shop including emergency and non-emergency, and short- and long-term hazards. Students will learn different control measures to minimize or eliminate these risks.

Learning Tasks & Content

- | | |
|---|---|
| 1. Demonstrate emergency and non-emergency procedures in the machine shop | Identify where the following are located: <ul style="list-style-type: none">▪ Emergency shutoffs▪ Fire control systems▪ Eye wash facilities▪ Emergency exits▪ Emergency contact/phone numbers▪ Outside meeting place▪ Disaster meeting place▪ First aid facilities |
| 2. Describe and use PPE in the machine shop | Explain why the following PPE are required: <ul style="list-style-type: none">▪ Steel-toe boots▪ Safety glasses▪ Hearing protection▪ Long sleeved shirts and pants Identify where and when PPE should be used: <ul style="list-style-type: none">▪ Mandatory use▪ No gloves around certain equipment▪ Drilling and grinding▪ Hammering |
| 3. Describe short-term hazards in the machinist industry and apply good work habits to minimize them. | Identify and explain the hazards with the following: <ul style="list-style-type: none">▪ Sharp objects▪ Lifting/material handling▪ Personal apparel<ul style="list-style-type: none">▪ Clothing▪ Hair and beards▪ Jewellery▪ Housekeeping▪ Clear head▪ Horseplay▪ Respect for others safety▪ Constant awareness of surroundings and Distractions▪ Safe attitude▪ Management of hazards |



Learning Tasks & Content

- | | |
|---|--|
| <p>4. Describe long-term hazards in the machinist industry and apply good work habits to minimize them.</p> | <p>Identify and explain the following hazards:</p> <ul style="list-style-type: none">▪ Respiratory disease▪ Asbestos▪ Repetitive strain injuries▪ Management of hazards |
|---|--|
-



Competency O3: Use Machinist Tools and Equipment

Brief Description

Students will be introduced to the most common tools used in the machinist trade. The student will learn how to select and identify the proper tool for the job, as well as the safe operation of it

Learning Tasks & Content

1. Select, use and maintain hand tools
 - Wrenches
 - Screwdrivers
 - Cutting
 - Saws
 - Abrasives
 - Files
 - Taps and dies
 - Hammers
 - Chisels/punches
 - Clamping tools
 - Pullers
 - Vises
2. Select layout tools
 - Layout dye
 - Scribes
 - Dividers
 - Centre punch
 - Height gauges
 - Rulers
 - Combination set
 - Surface gauge
 - V-blocks
 - Angle plates
3. Describe layout procedures
 - Material selection
 - Adequate stock size
 - Establish procedures steps
 - Datum points
 - Datum faces
 - Tool selection



Learning Tasks & Content

- | | |
|--|--|
| 4. Describe handheld power tool safety | <ul style="list-style-type: none">▪ Personal protective equipment▪ Guards▪ Electrical cords▪ Operating procedures▪ Securing work▪ Compressed air▪ Tool maintenance |
| 5. Select handheld power tools | <ul style="list-style-type: none">▪ Electric▪ Cutting▪ Grinding▪ Drilling▪ Pneumatic▪ Cutting▪ Grinding▪ Drilling |
| 6. Identify and describe work piece marking procedures | <ul style="list-style-type: none">▪ Etching▪ Engraving▪ Colour coding▪ Stamping |
| 7. Mark work pieces without causing damage | <ul style="list-style-type: none">▪ Engraving▪ Colour coding▪ Ink stamping▪ Acid etching |



Competency O4: Complete Machinist Projects

Brief Description

Students will perform tasks related to the type of work related to being a machinist. Project and activities will use appropriate practices, material, tools and equipment.

Learning Tasks & Content

1. Complete activity or project relating to the tasks required of a machinist using appropriate materials, tools, equipment, and safety procedures.
 - Select the material appropriate to the project
 - Interpret shop drawings and follow verbal instructions to plan, measure and lay out projects
 - Select and use the tools and equipment appropriate to the project
 - Construct and assemble projects using safe practices and procedures



APPENDIX A: TRADES SAMPLER COURSE CODES

EXISTING COURSE CODE	EXISTING COURSE NAME	NEW COURSE CODE	NEW COURSE NAME
PSIA 12A	BC Institute of Technology Course 12	TSTA 12A	Explore: Trades Sampler (BCIT) 12
PSIA 12B		TSTA 12B	
PSIA 12C		TSTA 12C	
PSIB 12A	Camosun College Course 12A	TSTB 12A	Explore: Trades Sampler (Camosun) 12
PSIB 12B		TSTB 12B	
PSIB 12C		TSTB 12C	
PSID 12A	College of New Caledonia Course 12A	TSTD 12A	Explore: Trades Sampler (CNC) 12
PSID 12B		TSTD 12B	
PSID 12C		TSTD 12C	
PSIE 12A	College of the Rockies Course 12A	TSTE 12A	Explore: Trades Sampler (COTR) 12
PSIE 12B		TSTE 12B	
PSIE 12C		TSTE 12C	
PSIJ 12A	Kwantlen Polytechnic University Course 12A	TSTJ 12A	Explore: Trades Sampler (KPU) 12
PSIJ 12B		TSTJ 12B	
PSIJ 12C		TSTJ 12C	
PSIL 12A	Vancouver Island University Course 12A	TSTL 12A	Explore: Trades Sampler (VIU) 12
PSIL 12B		TSTL 12B	
PSIL 12C		TSTL 12C	
PSIM 12A	Nicola Valley Institute of Technology Course 12A	TSTM 12A	Explore: Trades Sampler (NVIT) 12
PSIM 12B		TSTM 12B	
PSIM 12C		TSTM 12C	
PSIN 12A	North Island College Course 12A	TSTN 12A	Explore: Trades Sampler (N. Island) 12
PSIN 12B		TSTN 12B	
PSIN 12C		TSTN 12C	
PSIO 12A	North Lights College Course 12A	TSTO 12A	Explore: Trades Sampler (N. Lights) 12
PSIO 12B		TSTO 12B	
PSIO 12C		TSTO 12C	
PSIP 12A	Northwest Community College Course 12A	TSTP 12A	Explore: Trades Sampler (NWCC) 12
PSIP 12B		TSTP 12B	
PSIP 12C		TSTP 12C	
PSIQ 12A	Okanagan College Course 12A	TSTQ 12A	Explore: Trades Sampler (Okanagan) 12
PSIQ 12B		TSTQ 12B	
PSIQ 12C		TSTQ 12C	



EXISTING COURSE CODE	EXISTING COURSE NAME	NEW COURSE CODE	NEW COURSE NAME
PSIS 12A	Selkirk College Course 12A	TSTS 12A	Explore: Trades Sampler (Selkirk) 12
PSIS 12B		TSTS 12B	
PSIS 12C		TSTS 12C	
PSITA 12A	ITA Designated Training Provider, or a PSI unable to issue course credits Course 12A	TST-ITA 12A	Explore: Trades Sampler (ITA) 12
PSITA 12B		TST-ITA 12B	
PSITA 12C		TST-ITA 12C	
PSIV 12A	Thompson Rivers University Course 12A	TSTV 12A	Explore: Trades Sampler (TRU) 12
PSIV 12B		TSTV 12B	
PSIV 12C		TSTV 12C	
PSIW 12A	University of the Fraser Valley Course 12A	TSTW 12A	Explore: Trades Sampler (UFV) 12
PSIW 12B		TSTW 12B	
PSIW 12C		TSTW 12C	
PSIZ 12A	Vancouver Community College Course 12A	TSTZ 12A	Explore: Trades Sampler (VCC) 12
PSIZ 12B		TSTZ 12B	
PSIZ 12C		TSTZ 12C	



APPENDIX B: YOUTH EXPLORE TRADES SAMPLER INTAKE FORM – FOR ADULTS

Please see the attached sample form, or go online at:

<http://youth.itabc.ca/wp-content/uploads/2016/09/Youth-Explore-Trades-Sampler-Intake-Form-Oct-2016.pdf>



APPENDIX C: SAMPLE MARKS FORM

Student:	Student Number:	Course Date Start: Course End:
----------	-----------------	-----------------------------------

Module Topic	Rating	Secondary Grades		Competency is defined as: 1. NC: Not Complete – has not met minimum standards 2. COM: Complete – has met minimum standards 3. DST: Distinguished – has exceeded minimum standards Secondary Grade % conversion is based on the following: <table border="1" data-bbox="885 688 1393 898"> <thead> <tr> <th>Rating</th> <th>Description</th> <th>%</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>NC</td> <td>Not Yet</td> <td>0–49</td> <td>1</td> </tr> <tr> <td>NC</td> <td>Minimal</td> <td>50–69</td> <td>2</td> </tr> <tr> <td>COM</td> <td>Competent</td> <td>70–94</td> <td>3</td> </tr> <tr> <td>DST</td> <td>Exceeding</td> <td>95–100</td> <td>4</td> </tr> </tbody> </table>	Rating	Description	%	Level	NC	Not Yet	0–49	1	NC	Minimal	50–69	2	COM	Competent	70–94	3	DST	Exceeding	95–100	4
Rating	Description	%	Level																					
NC	Not Yet	0–49	1																					
NC	Minimal	50–69	2																					
COM	Competent	70–94	3																					
DST	Exceeding	95–100	4																					
Essential Skills		12A																						
Use Safe Work Practices		12B																						
Use Tools and Equipment		12C																						
Trades Module A		WEX																						
Trades Module B																								
Trades Module C																								
Overall Final Rating – PSI:		Overall rating – students must complete at least 4 of the 6 learning outcomes at a COM or DST level to successfully complete program																						

Certificates Completed	<input type="checkbox"/> WHMIS	<input type="checkbox"/> Occupational First Aid Level 1
	<input type="checkbox"/> Other (please specify):	

Work Habits	Excellent	Good	Satisfactory	Needs Improvement
Attendance				
Participation				
Active learner				
Time management				

Attendance	Days Absent		Days Late	
-------------------	-------------	--	-----------	--

Instructor Comment:

Instructor:	Signature:
-------------	------------

Report Date:

