

# Apprenticeship and Industry Training

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## Crane and Hoisting Equipment Operator- Mobile Crane Operator/Boom Truck Operator Curriculum Guide

**034-1 (2022)**

**034-3 (2022)**



Apprenticeship  
and Industry  
Training

**ALBERTA ADVANCED EDUCATION**

Crane and Hoisting Equipment Operator –  
Mobile Crane Operator/Boom Truck Operator: apprenticeship education program curriculum guide

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## Apprenticeship

Apprenticeship is post-secondary education with a difference. Apprenticeship begins with finding a sponsor. Sponsors guide apprentices, and support on-the-job learning through provision of mentorship. Approximately 80 per cent of an apprentice's time is spent on the job under the supervision of a certified journeyman or qualified tradesperson. The other 20 per cent involves technical training provided at, or through, a post-secondary institution (PSI) – usually a college or technical institute.

To receive their post-secondary credential, apprentices must learn theory and skills, and they must pass examinations. Criteria for the program—including the content and delivery of technical training—are developed and updated by the Registrar.

The graduate of the Mobile Crane/Boom Truck apprenticeship program is an individual who will be able to:

- maintain tools and equipment.
- demonstrate safe work practices.
- recognize and mitigate hazardous conditions related to boom truck/mobile crane operation.
- interpret and apply load charts, manufacturers manual and other related documentation.
- apply reference use, management and organizational skills.
- set-up boom truck/mobile crane for a lift.
- rig the load for lifting.
- hoist as per signals.
- operate the boom truck/mobile crane to lift and set the load
- prepare the boom truck/mobile crane for travel.
- understand the fundamentals of operating a small business.
- perform assigned tasks in accordance with quality and production standards required by industry.

### Apprenticeship and Industry Training System

Alberta's apprenticeship education programs are supported by industry stakeholders that ensures a highly skilled, internationally competitive workforce in the province. The Registrar establishes the educational standards and provides direction to the system supported by industry and the PSI's. The Ministry of Advanced Education provides the legislative framework and administrative support for the apprenticeship and industry training system.

**Special thanks are offered to the following industry members who contributed to the development of the standard:**

Mr. S. Fryer ..... Edmonton  
Mr. S. Gibson ..... Ft. Saskatchewan  
Mr. J. Kidd ..... Ft. McMurray  
Mr. D. Secord ..... Spruce Grove  
Mr. T. Tessier ..... Calgary  
Mr. M. Iliffe..... Devon  
Mr. D. Stanley..... Calgary  
Mr. M. Stokes ..... Beaumont

### Alberta Government

Alberta Advanced Education works with industry, sponsor and employee organizations and technical training providers to:

- facilitate industry's development and maintenance of training and certification standards
- provide registration and counselling services to apprentices and sponsors
- coordinate technical training in collaboration with training providers
- certify apprentices and others who meet industry standards

## **Apprentice Safety**

Safe working procedures and conditions, incident/injury prevention, and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, sponsors, employees, apprentices and the public. Therefore, it is imperative that all parties are aware of circumstances that may lead to injury or harm.

Safe learning experiences and healthy environments can be created by controlling the variables and behaviours that may contribute to or cause an incident or injury. By practicing a safe and healthy attitude, everyone can enjoy the benefit of an incident and injury free environment.

## **Occupational Health and Safety**

Persons engaged in, or supporting an individual in an experiential learning environment are often exposed to more worksite hazards than in other forms of traditional post-secondary education and therefore should be familiar with and apply the Occupational Health and Safety Act, Regulations and Code when dealing with personal safety and the special safety rules that apply to all daily tasks.

Occupational Health and Safety-OHS (a division of Alberta Labour and Immigration) conducts periodic inspections of workplaces to ensure that safety regulations for industry are being observed.

Additional information is available at [www.alberta.ca/occupational-health-safety.aspx](http://www.alberta.ca/occupational-health-safety.aspx)

## **Technical Training**

Apprenticeship technical training is delivered by the PSI's throughout Alberta. The PSI's are committed to delivering the technical training component of Alberta apprenticeship programs in a safe, efficient and effective manner. All PSI's place a strong emphasis on safety that complements safe workplace practices towards the development of a culture of safety for all professions.

The PSI's work with industry and Alberta Advanced Education to enhance access and responsiveness to industry needs through the delivery of the technical training component of apprenticeship education programs across the province. They develop curriculum from the curriculum guides established by the Registrar in consultation with the PSI's and industry and provide the technical training to apprentices.

The following PSI's deliver Crane and Hoisting Equipment Operator – Mobile Crane Operator trade apprenticeship training/Boom Truck Operator trade apprenticeship training:

Northern Alberta Institute of Technology (NAIT)	Northern Lakes College
Southern Alberta Institute of Technology (SAIT)	
Keyano College	

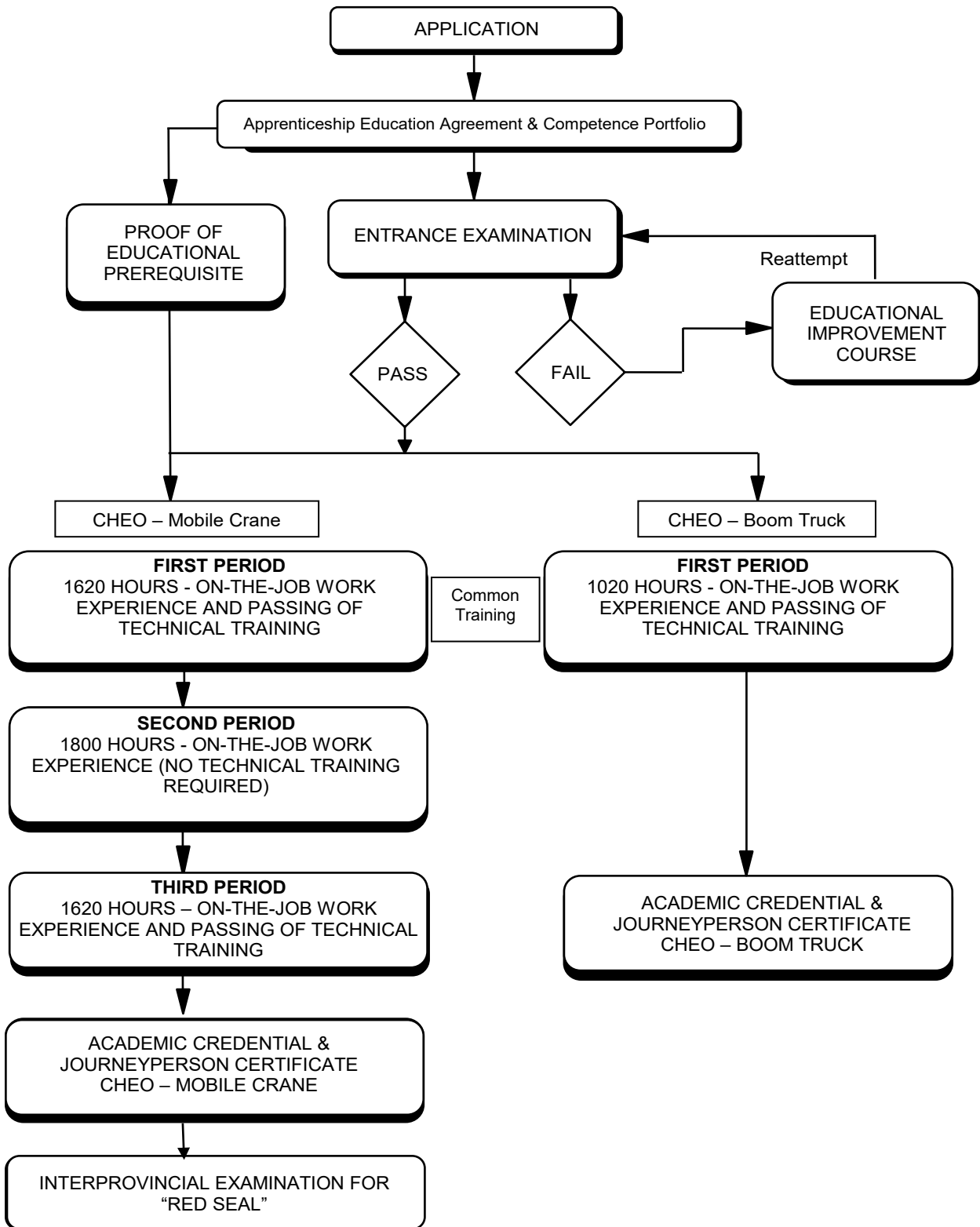
## **Procedures for Recommending Revisions to the Curriculum Guide**

Any concerned individual or group in the province of Alberta may make recommendations for change by writing to:

Registrar of Apprenticeship Education Programs  
c/o Apprenticeship Delivery and Industry Support Services  
Apprenticeship Delivery and Industry Support  
Advanced Education  
19th floor, Commerce Place  
10155 102 Street NW  
Edmonton AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used.

## Apprenticeship Route toward Academic Credential



**Crane and Hoisting Equipment Operator-  
Mobile Crane Operator / Boom Truck Operator  
FIRST PERIOD – Common Core  
(6 Weeks 30 Hours per Week – Total of 180 Hours)**

**SECTION ONE**

**STANDARD WORKPLACE  
SAFETY, MATERIALS AND  
TOOLS**  
14%



**A**

Safety Legislation,  
Regulations & Industry Policy  
in the Trades  
12%

**B**

Climbing, Lifting, Rigging and  
Hoisting  
21%

**C**

Hazardous Materials and  
Fire Protection  
13%

**SECTION TWO**

**INTRODUCTION TO BOOM  
TRUCKS AND CRANES, CODES  
AND DOCUMENTATION**  
12%



**D**

Apprenticeship Education  
Training Program  
4%

**E**

Codes and Regulations  
50%

**A**

Types of Boom Trucks  
10%

**B**

Boom Truck Components  
9%

**C**

Types of Mobile Cranes  
9%

**D**

Mobile Crane Components  
18%

**E**

Hoisting Equipment  
Maintenance  
45%

**F**

Documentation  
9%

**SECTION THREE**

**RIGGING EQUIPMENT AND  
PROCEDURES**  
22%



**A**

Types of Slings  
5%

**B**

Rigging Hardware and  
Accessories  
5%

**C**

Rigging Calculations  
45%

**D**

Rigging Procedures  
15%

**E**

Crane Signals and  
Communication  
30%

**SECTION FOUR**

**LOAD CHART READING AND  
INTERPRETATION**  
17%



**A**

Load Charts  
100%

**SECTION FIVE**

**EQUIPMENT OPERATION**  
22%



**A**

Equipment Transportation  
5%

**B**

Site Preparation  
5%

**C**

Loading and Unloading  
Equipment  
5%

**D**

Assembly and Disassembly  
of Hoisting Equipment  
8%

**E**

Equipment Set Up  
30%

**F**

Principles of Operation  
5%

**G**

Lift Planning  
15%

**H**

Lift Operations  
25%

**I**

Leaving Crane Unattended  
2%

**SECTION SIX**

**SPECIALTY LIFTS AND  
WORKPLACE COACHING**

13%



**A**

Multi-Crane Lifts

42%

**B**

Personnel Baskets

25%

**C**

New Technology

21%

**D**

Workplace Coaching Skills

12%



**THIRD PERIOD – Mobile Crane Operator  
(6 Weeks 30 Hours per Week – Total of 180 Hours)**

**SECTION ONE**

<b>LATTICE BOOM CRANES</b>  12%	⇒	<b>A</b>	<b>B</b>	<b>C</b>
		Types of Lattice Boom Cranes 19%	Lattice Boom Components 27%	Lattice Boom Inspection and Maintenance 27%
		<b>D</b>		
		Mobile Telescopic Cranes 27%		

**SECTION TWO**

<b>CRANE ATTACHMENTS AND CRANE ASSEMBLY</b>  19%	⇒	<b>A</b>	<b>B</b>	<b>C</b>
		Jibs 9%	Heavy Lift Attachments 18%	Specialty Accessories 6%
		<b>D</b>	<b>E</b>	<b>F</b>
		Site Preparation 18%	Loading and Unloading Cranes and Components 19%	Crane Assembly and Disassembly 30%

**SECTION THREE**

<b>ADVANCED RIGGING</b>  18%	⇒	<b>A</b>	<b>B</b>	<b>C</b>
		Specialty Rigging Equipment 19%	Advanced Rigging Procedures 18%	Advanced Rigging Calculations 63%

**SECTION FOUR**

<b>ADVANCED LIFT PLANNING AND OPERATION</b>  33%	⇒	<b>A</b>	<b>B</b>	<b>C</b>
		Critical Lift Planning 16%	Multi-Crane Lifts 42%	Single Crane Operations 42%

**SECTION FIVE**

<b>LOAD CHART, LIFTING OPERATIONS, RED SEAL</b>  18%	⇒	<b>A</b>	<b>B</b>	<b>C</b>
		Advanced Load Chart Interpreting 76%	Lift Dynamics 18%	Interprovincial Standards Red Seal Program 6%

**FIRST PERIOD TECHNICAL TRAINING – COMMON CORE  
CRANE AND HOISTING EQUIPMENT OPERATOR – MOBILE CRANE OPERATOR TRADE/  
BOOM TRUCK OPERATOR TRADE  
CURRICULUM GUIDE**

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

**SECTION ONE:.....STANDARD WORKPLACE SAFETY, MATERIALS & TOOLS..... 14%**

**A. Safety Legislation, Regulations & Industry Policy in the Trades ..... 12%**

**Outcome:**     ***Apply legislation, regulations and practices ensuring safe work in this trade.***

1. Demonstrate the application of the Occupational Health and Safety Act, Regulation and Code.
2. Describe the sponsor's and employee's role with Occupational Health and Safety (OH&S) regulations, Worksite Hazardous Materials Information Systems (WHMIS), fire regulations, Workers Compensation Board regulations and related advisory bodies and agencies.
3. Describe industry practices for hazard assessment and control procedures.
4. Describe the responsibilities of worker and sponsors to apply emergency procedures.
5. Describe tradesperson attitudes with respect to housekeeping, personal protective equipment and emergency procedures.
6. Describe the roles and responsibilities of sponsors and employees with the selection and use of personal protective equipment (PPE).
7. Maintain required PPE for tasks.
8. Use required PPE for tasks.

**B. Climbing, Lifting, Rigging and Hoisting..... 21%**

**Outcome:**     ***Use industry standard practices for climbing, lifting, rigging and hoisting in this trade.***

1. Describe manual lifting procedures.
2. Describe rigging hardware and associated safety factors.
3. Select equipment for rigging loads.
4. Describe hoisting and load moving procedures.
5. Maintain personal protective equipment (PPE) for climbing, lifting and load moving equipment.
6. Use PPE for climbing, lifting and load moving equipment.

**C. Hazardous Materials & Fire Protection ..... 13%**

**Outcome:**     ***Apply industry standard practices for hazardous materials and fire protection in this trade.***

1. Describe roles, responsibilities, features and practices related to the Workplace Hazardous Materials Information System (WHMIS) program.
2. Describe three key elements of WHMIS.
3. Describe handling, storing and transporting procedures for hazardous material.
4. Describe venting procedures when working with hazardous materials.
5. Describe hazards, classes, procedures and equipment related to fire protection.

**D. Apprenticeship Education Training Program .....4%****Outcome:    *Manage an apprenticeship to earn journeyperson certification.***

1.       Describe the contractual responsibilities of the apprentice, employer and Alberta Apprenticeship and Industry Training.
2.       Describe the purpose of the apprentice competency portfolio.
3.       Describe the procedure for changing sponsors during an active apprenticeship.
4.       Describe the purpose of the curriculum guide.
5.       Describe the procedure for progressing through an apprenticeship.
6.       Describe advancement opportunities in this trade.

**E. Codes and Regulations..... 50%****Outcome:    *Interpret codes and regulations.***

1.       Explain Alberta's trade regulations for the crane and hoisting equipment operator trade.
2.       Explain transportation rules and regulations.
3.       Identify the sections of Occupational Health and Safety code that apply to hoisting equipment.
4.       Interpret codes and standards for hoisting equipment.

**SECTION TWO: ..... INTRODUCTION TO BOOM TRUCKS AND CRANES ..... 12%****A. Types of Boom Trucks ..... 10%****Outcome:    *Identify the structural and operational characteristics of boom trucks.***

1.       Describe fixed station telescopic boom trucks.
2.       Describe swing cab telescopic boom trucks.
3.       Describe articulating boom trucks.

**B. Boom Truck Components.....9%****Outcome:    *Describe boom truck components.***

1.       Describe the truck chassis.
2.       Describe outriggers and stabilizers.
3.       Describe the upperworks of a boom truck.

**C. Types of Mobile Crane .....9%****Outcome:    *Identify the structural and operational characteristics of mobile cranes.***

1.       Describe carry deck cranes.
2.       Describe rough terrain cranes.
3.       Describe all terrain cranes.
4.       Describe truck mounted cranes.
5.       Describe crawler mounted cranes.
6.       Describe lattice boom cranes.

**D. Mobile Crane Components ..... 18%**

**Outcome: Describe mobile crane components.**

1. Describe wheeled carriers.
2. Describe crawler carriers.
3. Describe upperworks of mobile cranes.
4. Describe the composition and characteristics of wire rope.

**E. Hoisting Equipment Maintenance..... 45%**

**Outcome: Maintain hoisting equipment.**

1. Describe tools used to assemble and maintain hoisting equipment.
2. Identify maintenance on engines.
3. Identify maintenance on hydraulic systems.
4. Identify maintenance on air systems.
5. Identify maintenance on mechanical components and structures.
6. Identify maintenance on electrical systems.
7. Describe the types and characteristics of lubricant.
8. Identify the lubrication points on each components.

**F. Documentation .....9%**

**Outcome: Complete documentation.**

1. Complete a daily crane log book.
2. Complete maintenance request form.
3. Complete a hazard assessment.

**SECTION THREE: ..... RIGGING EQUIPMENT AND PROCEDURES ..... 22%**

**A. Types of Slings .....5%**

**Outcome: Describe the types and functions of slings.**

1. Describe slings used for rigging loads.
2. Describe Working Load Limits (WLL) for slings.
3. Interpret codes for slings and accessories.
4. Describe rigging configurations.
5. Describe the inspection of slings.
6. Describe rejection criteria for slings.
7. Describe the storage and maintenance of slings.

**B. Rigging Hardware and Accessories .....5%**

**Outcome: Describe types and functions of rigging hardware and accessories.**

1. Describe the use of rigging hardware.
2. Describe the use of rigging accessories.

**C. Rigging Calculations ..... 45%**

**Outcome: Calculate rigging capacities.**

1. Define capacities for configurations.
2. Determine capacity reducing factors.

**D. Rigging Procedures ..... 15%**

**Outcome: Rig loads.**

1. Explain characteristics of a load.
2. Determine center of gravity of the load.
3. Determine load weight.
4. Determine rigging configuration.
5. Rig the load.

**E. Crane Signals and Communication ..... 30%**

**Outcome: Signal the crane.**

1. Perform crane hand signals.
2. Perform verbal signals.

**SECTION FOUR: ..... LOAD CHART READING AND INTERPRETATION ..... 17%**

**A. Load Charts ..... 100%**

**Outcome: Interpret load charts for hoisting equipment.**

1. Determine gross and net load.
2. Determine gross and net capacities.
3. Determine percentage of gross capacity.
4. Perform load chart calculations.
5. Interpret range diagrams.
6. Analyze an engineered lift plan.
7. Define the parameters of a lift.

<b>SECTION FIVE:</b> .....	<b>EQUIPMENT OPERATION</b> .....	<b>22%</b>
<b>A. Equipment Transportation</b> .....		<b>5%</b>
<b>Outcome:</b>	<b><i>Prepare crane for travel on public roads and site.</i></b>	
1.	Explain transportation regulations for hoisting equipment in Alberta.	
2.	Determine manufacturer's transportation procedures.	
<b>B. Site Preparation</b> .....		<b>5%</b>
<b>Outcome:</b>	<b><i>Prepare site for hoisting equipment.</i></b>	
1.	Recognize ground site conditions.	
2.	Identify site hazards (powerlines, underground utilities, buildings).	
3.	Calculate ground bearing pressure.	
4.	Determine space requirements for assembly and disassembly.	
5.	Determine space requirements for lifting operations.	
<b>C. Loading and Unloading Hoisting Equipment</b> .....		<b>5%</b>
<b>Outcome:</b>	<b><i>Describe loading and unloading hoisting equipment.</i></b>	
1.	Determine orientation of the crane on the trailer.	
2.	Determine crane configuration.	
3.	Describe loading and unloading procedures.	
4.	Describe crane and component tie down procedures.	
<b>D. Assembly and Disassembly of Hoisting Equipment</b> .....		<b>8%</b>
<b>Outcome:</b>	<b><i>Configure hoisting equipment components.</i></b>	
1.	Identify crane components.	
2.	Describe the function of crane components.	
3.	Describe the assembly of a jib to manufactures specifications.	
4.	Demonstrate wire rope block reeving methods.	
5.	Perform a pre-operational inspection.	
<b>E. Equipment Set-Up</b> .....		<b>30%</b>
<b>Outcome:</b>	<b><i>Set-up hoisting equipment.</i></b>	
1.	Perform pre-operational inspection.	
2.	Set-up and level hoisting equipment.	
3.	Configure the hoisting equipment.	
4.	Function test all controls and limit switches.	
<b>F. Principles of Operation</b> .....		<b>5%</b>
<b>Outcome:</b>	<b><i>Describe the principles of operation.</i></b>	
1.	Describe the principles of leverage.	
2.	Describe load moment.	

- 3. Explain center of gravity.
- 4. Explain the mechanical advantage reeving.
- 5. Describe stability versus structural capacity.
- 6. Describe quadrants of operation.
- 7. Describe dynamic and static loading.
- 8. Describe the effect of the load on the hoisting equipment.
- 9. Describe the effects of various forces on the hoisting equipment.

**G. Lift Planning ..... 15%**

**Outcome: Create a lift plan.**

- 1. Determine load weight.
- 2. Perform site measurements.
- 3. Determine hoisting equipment configuration for the lift.
- 4. Determine load radius.
- 5. Complete load chart calculations.
- 6. Complete a lift plan drawing.
- 7. Determine percentage of capacity.
- 8. Explain a critical lift.

**H. Lifting Operations ..... 25%**

**Outcome: Operate hoisting equipment.**

- 1. Conduct lifting operations as per configuration on outriggers.
- 2. Explain a pick and carry operation.
- 3. Describe a multi-crane lift.
- 4. Describe hoisting personnel.

**I. Leave Crane Unattended .....2%**

**Outcome: Secure hoisting equipment.**

- 1. Describe the procedure for leaving a crane unattended for short periods.
- 2. Describe the procedure for leaving a crane unattended for long periods.
- 3. Describe the procedure for leaving a crane unattended for extended periods.

**SECTION SIX: .....SPECIALTY LIFTS AND WORKPLACE COACHING, ..... 13%**

**A. Multi-Crane Lifts ..... 42%**

**Outcome: Perform a multi-crane lift.**

- 1. Plan a multi-crane lift.
- 2. Set up a multi-crane lift.
- 3. Perform a multi-crane lift.

**B. Personnel Baskets ..... 25%**

**Outcome:**     ***Describe the use of a personnel basket.***

1.     Explain the requirements for attaching a suspended personnel platform to hoisting equipment.
2.     Explain the procedures for hoisting a suspended personnel basket.

**C. New Technology ..... 21%**

**Outcome:**     ***Describe new hoisting equipment technology.***

1.     Describe new technology used in hoisting and rigging equipment.

**D. Workplace Coaching Skills..... 12%**

**Outcome:**     ***Use coaching skills when training an apprentice.***

1.     Describe the process for coaching an apprentice.



**THIRD PERIOD TECHNICAL TRAINING  
CRANE AND HOISTING EQUIPMENT OPERATOR – MOBILE CRANE OPERATOR TRADE  
CURRICULUM GUIDE**

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

**SECTION ONE:..... LATTICE BOOM CRANES..... 12%**

**A. Types of Lattice Boom Cranes ..... 19%**

**Outcome:     *Describe types of lattice boom cranes.***

1.     Describe truck mounted lattice boom cranes.
2.     Describe crawler mounted lattice boom cranes
3.     Explain friction drawworks operation.

**B. Lattice Boom Crane Components ..... 27%**

**Outcome:     *Describe lattice boom crane components.***

1.     Describe truck mounted lattice boom components.
2.     Describe crawler mounted lattice boom components.
3.     Describe friction drawworks components.

**C. Lattice Boom Crane Inspections and Maintenance..... 27%**

**Outcome:     *Inspect and maintain lattice boom cranes.***

1.     Describe tools used to assemble and maintain lattice boom.
2.     Identify maintenance on engines.
3.     Identify maintenance on hydraulic systems.
4.     Identify maintenance on air systems.
5.     Identify maintenance on mechanical components and structures.
6.     Identify maintenance on electrical systems.
7.     Describe the types and characteristics of lubricant.
8.     Identify the lubrication points on each component.

**D. Mobile Telescopic Cranes ..... 27%**

**Outcome:     *Describe types of mobile telescopic cranes.***

1.     Describe pinned boom technology.
2.     Describe a telescopic boom crawler crane.
3.     Describe all terrain suspensions.
4.     Describe all terrain removable counter weights.
5.     Describe the use of dollies.

**SECTION TWO:.....CRANE ATTACHMENTS AND CRANE ASSEMBLY ..... 19%**

**A. Jibs ..... 9%**

**Outcome: Describe types of jibs.**

1. Describe fixed jibs.
2. Describe hydraulic offset jibs.
3. Describe cable luffing jibs.
4. Describe boom extensions.

**B. Heavy Lift Attachments ..... 18%**

**Outcome: Describe heavy lift attachments.**

1. Describe ballast wagons and components.
2. Describe ballast trays and components.
3. Describe guyed boom.
4. Describe ringer attachment configurations.
5. Describe a strand jacking system.

**C. Specialty Accessories ..... 6%**

**Outcome: Describe specialty accessories.**

1. Describe earth moving accessories.
2. Describe material handling accessories.
3. Describe the use of a demolition ball.
4. Describe pile driving accessories.

**D. Site Preparation..... 18%**

**Outcome: Prepare site for crane.**

1. Recognize ground site conditions.
2. Identify site hazards (powerlines, underground utilities, buildings).
3. Calculate ground bearing pressure.
4. Determine space requirements for assembly and disassembly.
5. Determine space requirements for lifting operations.

**E. Loading and Unloading Cranes and Components ..... 19%**

**Outcome: Describe loading and unloading crane components.**

1. Describe loading and unloading of carbody.
2. Describe the loading and unloading of the upperworks.
3. Describe the loading and unloading of track frames.
4. Describe the loading and unloading of boom components.
5. Describe the loading and unloading of counterweights.

**F. Crane Assembly and Disassembly ..... 30%**

**Outcome: Assemble and disassemble cranes and components.**

1. Describe the sequence of assembly and disassembly of lattice boom cranes.
2. Describe the assembly and disassembly of hydraulic telescopic cranes.

**SECTION THREE: .....ADVANCED RIGGING ..... 18%**

**A. Specialty Rigging Equipment ..... 19%**

**Outcome: Describe specialty rigging equipment.**

1. Describe the application of specialty rigging equipment (i.e. rolling blocks, jigs, transfer beams).
2. Select appropriate specialty rigging equipment.
3. Describe heavy lift rigging equipment.

**B. Advanced Rigging Procedures ..... 18%**

**Outcome: Perform advanced rigging procedure.**

1. Describe advanced rigging on an off center of gravity load.
2. Describe the application of multi-point rigging attachments.
3. Describe heavy lift rigging procedures.

**C. Advanced Rigging Calculations ..... 63%**

**Outcome: Calculate advanced rigging configurations.**

1. Calculate load weights for various shaped loads of different materials.
2. Determine combined center of gravity.
3. Determine the center of gravity for off center of gravity loads.
4. Calculate loads on equalizer beams.

**SECTION FOUR: .....ADVANCED LIFT PLANNING AND OPERATIONS ..... 33%**

**A. Critical Lift Planning ..... 16%**

**Outcome: Plan a critical lift.**

1. Determine critical lift criteria.
2. Determine the type of critical lift.
3. Create a critical lift plan drawing.
4. Explain the sequence of a critical lift.
5. Explain the hazard controls of a critical lift.

**B. Multi-Crane Lift ..... 42%**

**Outcome: Plan a multi-crane lift.**

1. Determine the type of multi-crane lift (tailing, straight, maneuvering).
2. Determine share of load.
3. Determine the percentage of capacity for each crane.

4. Explain lift dynamics for standing a load.
5. Explain the sequence of a multi-crane lift.
6. Create a multi-crane lift plan drawing.
7. Perform a multi-crane lift.

**C. Single Crane Operations ..... 42%**

**Outcome: Plan a lift.**

1. Perform pick and carry operations on rubber.
2. Perform lifts on outriggers.
3. Perform a standing lift.
4. Perform a lift with a jib.

**SECTION FIVE: .....LOAD CHART, LIFTING OPERATIONS AND RED SEAL ..... 18%**

**A. Advanced Load Chart Interpreting ..... 76%**

**Outcome: Perform advanced load chart calculations.**

1. Perform lift calculations for a critical lift.
2. Perform a lift calculation for an offset jib.
3. Perform a lift calculation for a luffing jib.
4. Perform a lift calculation for load using a specialty attachment.

**B. Lift Dynamics ..... 18%**

**Outcome: Describe lift dynamics.**

1. Explain the dynamics of duty cycle work.
2. Explain the dynamics of wind during a lift.
3. Explain the dynamics of submerged loads.
4. Explain the dynamics of hoisting on floating surface.
5. Explain the dynamics of hoisting a stuck or frozen load.
6. Explain dynamics of shock loading.
7. Explain the dynamics of standing a load.
8. Explain the dynamics of transferring a load.

**C. Interprovincial Standards Red Seal Program ..... 6%**

**Outcome: Use red seal products to challenge an Interprovincial examination.**

1. Identify Red Seal products used to develop Interprovincial examinations.
2. Use Red Seal products to prepare for an Interprovincial examination.



# Apprenticeship and Industry Training

Alberta Trades. World Ready.

**034-1**  
**034-3**