



# Heavy Mechanical Foundation Program – HMFP Trades Training

## Program Outline

PROGRAM IMPLEMENTATION DATE: March 2002  
 OUTLINE EFFECTIVE DATE: September 2022  
 PROGRAM OUTLINE REVIEW DATE: April 2027

### GENERAL PROGRAM DESCRIPTION:

This comprehensive 36-week Heavy Mechanical Foundation (pre-apprenticeship) program provides students with the skills, knowledge and training necessary for entry level positions in the heavy mechanical industry and covers the program competencies for Level 1 of the Apprenticeship Programs for the following trades: Heavy Duty Equipment Technician; Truck and Transport Mechanic; Transport Trailer Technician; Diesel Engine Mechanic. Content covered includes occupational skills (safety, and tools, power tools, shop equipment, bearings and seals, cutting and welding procedures), hydraulic systems and brakes, electrical systems, frames, steering and suspension systems, trailer components, heating, ventilation and air conditioning systems, engines and supporting systems, and powertrains. The program includes classroom theory, demonstrations, and practical hands-on training in a heavy mechanical shop setting. Safe work habits are emphasized, reinforced and practiced throughout the program.

**Credentials Granted:** : Upon successful completion of the 36-week Heavy Mechanical Foundation program, students receive:

- Level 1 Technical Training credit from the Industry Training Authority for Level Heavy Duty Equipment Technician (HDET); Truck and Transport Mechanic (TTM); Transport Trailer Technician (TTT); Diesel Engine Mechanic (DEM) Apprenticeship programs
- Certificate of Completion Heavy Mechanical Foundation from the Industry Training Authority
- College of the Rockies Certificate
- Credit for 450 work-based Training hours towards HDET, TTM, TTT, DEM from the Industry Training Authority

**Delivery:** This program can be delivered face to face or hybrid (online with face-to-face components).

**Time for this program:** 36 weeks

#### Structure of Instructional Hours:

Instructional Activity	Duration
Instructional Hours	28 hrs/wk
Directed Studies	2 hrs/wk
Hours per week	30 hrs/wk
Total Program Hours	1080 hrs

Content Weightings	
Theory	30%
Practical Skills	70%
Total	100%

**Program Outline Author or Contact:**

Spencer Mellor, RSE Automotive Service Technician,  
RSE Heavy Duty Equipment Technician, PID

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Signature

**APPROVAL SIGNATURES:**

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Department Head Signature

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Dean Signature

EDCO

Valid from: September 2022 – April 2027

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Education Council Approval Date

**ADMISSION REQUIREMENTS:**

**Prerequisites:**

- Secondary school graduation or equivalent, or completion of a College of the Rockies assessment to an acceptable level

**Recommended prerequisites:** The following education is **highly** recommended for student success within the program:

- Workplace MATH 10 and Apprenticeship MATH 12. Either Apprenticeship and Workplace Math 11, Trades Mathematics 11, or equivalent
- Either English 12, English Studies 12, English First Peoples 12, ENGL 090, or equivalent (refer to Course Equivalency information on the College Website)

**Flexible Assessment (FA):**

Credit can be awarded for this course through FA  Yes  No

Learners may request formal recognition for flexible assessment at the College of the Rockies through one or more of the following processes: External Evaluation, Worksite Assessment, Demonstration, Standardized Test, Self-assessment, Interview, Products/Portfolio, Challenge Exam. Contact an Education Advisor for more information.

Student may apply for prior learning credit with the ITA (Industry Training Authority). Please visit [www.itabc.ca](http://www.itabc.ca).

**Prior Program Number:** N/A

## Textbooks and Required Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use (most current edition):

*Heavy Duty Foundation Competencies*, Queen's Printer.  
*Trac Common Core Learning Guide Line B Math*, Queen's Printer.  
*Heavy Truck Systems*

Please see the instructor's syllabus or check COTR's online text calculator <http://go.cotr.bc.ca/tuition/tCalc.asp> for a complete list of the currently required textbooks.

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## PROGRAM COMPETENCIES AND TECHNICAL TRAINING CONTENT:

Upon the successful completion of this program, students will be able to

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|-----------------|---|
| <b>HMFP 101</b> | <b>Occupational Skills</b> <ul style="list-style-type: none"><li>• Use Safe Work Practices</li><li>• Apply Occupational Health and Safety</li><li>• Use Environmental Practices</li><li>• Use Hand Tools, Power Tools, and Shop Equipment</li><li>• Use Fasteners and Fittings</li><li>• Lift and Support Loads</li><li>• Operate Equipment</li><li>• Use Shop Resources and Record Keeping Practices</li><li>• Service Winch Wire Rope</li><li>• Identify Lubricants</li><li>• Service Bearings and Seals</li><li>• Apply Math and Science</li><li>• Use Electronic Media</li><li>• Use Cutting and Welding Equipment</li><li>• Prepare Job Action</li><li>• Describe Diagnostic Procedures</li><li>• Prepare for Employment</li></ul> |
| <b>HMFP 102</b> | <b>Brakes</b> <ul style="list-style-type: none"><li>• Service and Repair Hydraulic Brakes</li><li>• Service and Repair Hydraulic Power Brakes</li><li>• Service and Repair Air Brakes</li></ul>   |
| <b>HMFP 103</b> | <b>Hydraulics</b> <ul style="list-style-type: none"><li>• Describe Hydraulic Systems</li><li>• Service Hydraulic Components</li></ul>   |
| <b>HMFP 104</b> | <b>Electrical</b> <ul style="list-style-type: none"><li>• Describe Electricity</li><li>• Use Electrical Testing Instruments</li><li>• Service and Diagnose Batteries</li><li>• Service Charging Systems</li></ul>   |

- Service Starting Systems
- Service Electrical Circuits

- HMFP 105      Frames, Steering and Suspension**
- Service and Diagnose Tires, Wheels, and Hubs
  - Service Steering Systems
  - Service, Diagnose and Repair Suspension Systems
  - Remove and Install Undercarriage
  - Diagnose and Repair Frames

- HMFP 106      Trailer**
- Service Landing Gear and Trailer Accessories
  - Service and Repair Coupling Systems
  - Service, Diagnose and Repair Trailer Body Components
  - Service, Diagnose and Repair Heating and Refrigeration Systems

- HMFP 107      Heating, Ventilation, Air Conditioning**
- Describe, Heating and Air Conditioning Fundamentals
  - Diagnose and Repair Heating and Air Conditioning Systems

- HMFP 108      Engines and Supporting Systems**
- Service Engine Support Systems
  - Service Diesel Fuel Supply Systems
  - Service Gasoline Fuel Systems
  - Remove and Install Diesel Engine
  - Service, Diagnose and Repair Electronic Ignition Systems

- HMFP 109      Powertrains**
- Service Clutches
  - Service Manual Transmissions
  - Service Torque Converters and Dividers
  - Service Powershift and Automatic Transmissions
  - Service Drivelines
  - Service Drive Axles
  - Service Final Drives
  - Remove and Install Transmissions
  - Remove and Install Drivelines and Differentials
  - Remove and Install Final Drives

- HMFP 110      Structural Components and Accessories**
- Identify Protective Structures
  - Service Cab Structures

The program competencies and technical training content delivered in this program follow the Industry Training Authority Program Outline for this trade.

See instructor’s syllabus for the detailed outline of weekly readings, activities and assignments.

**WORKPLACE HEALTH AND SAFETY COURSES:**

**Students must pass the following Workplace Health and Safety courses for program completion:**

- Workplace Hazardous Material Information System (*WHMIS: PVHE-700*)
- Occupational First Aid – Level 1 (*OFA-1: PVHE-100*) \*

\*Students must complete Occupational First Aid Level 1 within the program or have a current Occupational First Aid Level 1 certificate valid to the end of the program.

**EVALUATION AND ASSESSMENT:**

<b>HEAVY MECHANICAL FOUNDATION</b>			
<b>COTR COURSE</b>	<b>SUBJECT COMPETENCIES</b>	<b>THEORY WEIGHTING</b>	<b>PRACTICAL WEIGHTING</b>
HMFP 101	Occupational Skills	30%	27%
HMFP 102	Brakes	12%	10%
HMFP 103	Hydraulics	7%	6%
HMFP 104	Electrical	9%	10%
HMFP 105	Frames, Steering and Suspension	15%	16%
HMFP 106	Trailer	7%	6%
HMFP 107	Heating, Ventilation, Air Conditioning	2%	3%
HMFP 108	Engines and Supporting Systems	10%	10%
HMFP 109	Powertrains	7%	6%
HMFP 110	Structural Components and Accessories	1%	6%
	<b>Total</b>	<b>100%</b>	<b>100%</b>
<b>In-School Theory/Practical Subject Competency Weighting</b>		30%	70%
<b>Final in-school percentage score</b> Students must achieve a minimum 70% overall as the final in-school percentage score		<b>IN-SCHOOL %</b>	

This program has a final exam that is administered on the last day of the program. The final percentage score for determining credit from the College of the Rockies Heavy Mechanical Foundation program is calculated as follows:

<b>In-school percentage score</b> Combined theory and practical subject competency	80%
<b>Final Exam</b>	20%
<b>Final percentage score</b>	FINAL%

**Pass Requirements:**

**In order to pass this program, students are required to**

- achieve a minimum 70% overall final in-school percentage score
- pass all Workplace Health and Safety courses within the program

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**SAFETY:**

WorkSafeBC regulations apply to all trades programs. Students are expected to follow all safe work practices and have high regard for the safety of others as well as of themselves. Students are responsible to wear personal protective equipment (PPE) as directed. At a minimum, students must provide and wear approved safety footwear and eyewear at all times in the shop. Additional PPE may be required for specific tasks. Students are expected to wear clothing suitable for working safely in the shop.

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**STUDENTS MUST PROVIDE THEIR OWN:**

- Steel-toed leather work boots
- Safety glasses
- Coveralls and flame-resistant work clothes and high visible
- Leather welding gloves
- Welding goggles with #5 lens
- Digital Multi-meter – 10 MΩ impedance
- Computer
- Reference manuals (as listed on third page)
- Pens, pencils, coloured pencils, three-ring binder, paper
- Calculator

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**EXAM POLICY:**

Students must attend all required scheduled exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the scheduled exam.

Any student who misses a scheduled exam without approval will be given a grade of “0” for the exam.

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**PROGRAM GRADE:**

Program grades are assigned as follows:

<b>COM</b>	Completed to defined standard $\geq$ 70%
<b>NCG</b>	No Credit Granted $<$ 70%

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**ACADEMIC POLICIES:**

See [www.cotr.bc.ca/policies](http://www.cotr.bc.ca/policies) for general college policies related to program activities, including grade appeals, cheating and plagiarism.

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**PROGRAM CHANGES:**

Information contained in program outlines is correct at the time of publication. Content of the programs is revised on an ongoing basis to ensure relevance to changing educational, employment and marketing needs. The instructor will endeavour to provide notice of changes to students as soon as possible. The instructor reserves the right to add material from programs.