



# Heavy Mechanical Foundation Program – HMF Trades Training

## Program Outline

PROGRAM IMPLEMENTATION DATE: March 2002  
 OUTLINE EFFECTIVE DATE: September 2024  
 PROGRAM OUTLINE REVIEW DATE: April 2029

### 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, workplace expectations, environmental practices), servicing, diagnosing and repairing 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 will receive:

- Level 1 Technical Training credit from SkilledTradesBC 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 SkilledTradesBC
- College of the Rockies Certificate
- Credit for 450 work-based Training hours towards HDET, TTM, TTT, DEM from SkilledTradesBC

**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:**

Dominic Perry, RSE

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Signature

**APPROVAL SIGNATURES:**

Department Head  
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Department Head Signature

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Dean Signature

EDCO

Valid from: September 2024 – April 2029

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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 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 STBC (SkilledTradesBC). Please visit [Home | SkilledTradesBC](#).

**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*, King's Printer.  
*Trac Common Core Learning Guide Line B Math*, King's Printer.  
*Heavy Truck Systems*

Please see the instructor's syllabus or check COTR's online text calculator <https://textbook.cotr.bc.ca/> 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

- HMFP 101      Perform Occupational Skills**
- Use safe work practices
  - Implement hybrid and electric vehicle (EV) safety protocols
  - Use hand tools, power tools, and shop equipment
  - Use fasteners and fittings
  - Lift and support loads
  - Operate equipment
  - Use documentation and reference materials
  - Service bearings and seals
  - Select and maintain lubricants
  - Use cutting and welding equipment
  - Describe diagnostic procedures
  - Apply occupational health and safety skills
  - Use environmental practices
  - Apply mathematics
  - Describe workplace expectations
  - Prepare for employment
- HMFP 102      Service, Diagnose, and Repair Brakes**
- Service and repair hydraulic brakes and parking brakes
  - Service and repair hydraulic power brakes and ABS systems
  - Service and repair air brakes
- HMFP 103      Service, Diagnose, and Repair Hydraulics**
- Service hydraulic components
- HMFP 104      Service, Diagnose, and Repair Electrical and Electronic Systems**
- Describe electricity
  - Use electrical testing instruments
  - Service, diagnose, and repair battery systems
  - Service starting and charging systems
  - Service electrical circuits

- HMFP 105      Service, Diagnose, and Repair Frames, Steering, and Suspension**
- Service, diagnose, and repair tires, wheels, and hubs
  - Service steering systems
  - Service, diagnose, and repair suspension systems
  - Service, diagnose, and repair frames
  - Remove and install undercarriage
- HMFP 106      Service, Diagnose, and Repair Trailers**
- Service, diagnose, and repair landing gear and trailer accessories
  - Service, diagnose, and repair coupling systems
  - Service, diagnose and repair trailer body components
  - Service heating and refrigeration systems
- HMFP 107      Service, Diagnose, and Repair Heating, Ventilation, Air Conditioning**
- Describe heating and air conditioning fundamentals
- HMFP 108      Service, Diagnose, and Repair Engines and Supporting Systems**
- Service engine support systems
  - Service diesel fuel supply systems
  - Remove and install diesel engines
- HMFP 109      Service, Diagnose, and Repair Powertrains**
- Service clutches
  - Service manual transmissions
  - 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      Service, Diagnose, and Repair Structural Components and Accessories**
- Describe protective structures
  - Service, diagnose, and repair cab structures
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- HMFP 111      Use Communication and Mentoring Techniques**
- Use communication techniques

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

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

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## 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	Perform Occupational Skills	30%	20%
HMFP 102	Service, Diagnose, and Repair Brakes	14%	13%
HMFP 103	Service, Diagnose, and Repair Hydraulics	10%	6%
HMFP 104	Service, Diagnose, and Repair Electrical and Electronic Systems	10%	11%
HMFP 105	Service, Diagnose, and Repair Frames, Steering, and Suspension	14%	16%
HMFP 106	Service, Diagnose, and Repair Trailers	5%	11%
HMFP 107	Service, Diagnose, and Repair Heating, Ventilation, and Air Conditioning	5%	2%
HMFP 108	Service, Diagnose, and Repair Engines and Supporting Systems	5%	10%
HMFP 109	Service, Diagnose, and Repair Powertrains	5%	10%
HMFP 110	Service, Diagnose, and Repair Structural Components and Accessories	1%	1%
HMFP 111	Use Communication and Mentoring Techniques	1%	0%
	<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 overall 70% final 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
  - 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.