# HMFP – Heavy Mechanical Foundation Program

**Trades**

**Effective Term & Year:** Fall 2024
**Program Outline Review Date:** 2029-04-01

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**Program Area:** Trades Foundation Training

**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.

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**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 Methods:** On-Campus (Face-to-Face), Hybrid (Face-to-Face and Online)

**Program Duration:** 36 Weeks

**Instructional Activity and Hours:**

| Activity | Hours |
|---|---|
| Instructional Hours (hrs/wk) | 28 hrs/wk |
| Directed Studies (hrs/wk) | 2 hrs/wk |
| Total (hrs/wk) | 30 hrs/wk |
| Total Program Hours | 1080 hours |

**Content Weighting:**

| Activity | Percentage |
|---|---|
| Theory | 30% |
| Practical Skills | 70% |

**Admission Requirements:**

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

- Workplace Mathematics 10 and Apprenticeship Mathematics 12, or Workplace 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).

**Prior Learning and Recognition:**

Credit can be awarded for this program through Prior Learning Assessment and Recognition.

**Program Transfer Credit:**

For information about block transfer agreements between programs in British Columbia, Alberta, and elsewhere, please visit http://www.cotr.bc.ca/transfer.

To minimize transfer issues, check with an academic advisor at the institution that will receive the transfer credits.

## 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.*

## Program Competencies and Technical Training Content:

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

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

| | |
|---|---|
| **HMFP 104** | **Service, Diagnose, and Repair Electrical and Electronic Systems**<br>- Describe electricity<br>- Use electrical testing instruments<br>- Service, diagnose, and repair battery systems<br>- Service starting and charging systems<br>- Service electrical circuits |
| **HMFP 105** | **Service, Diagnose, and Repair Frames, Steering, and Suspension**<br>- Service, diagnose, and repair tires, wheels, and hubs<br>- Service steering systems<br>- Service, diagnose, and repair suspension systems<br>- Service, diagnose, and repair frames<br>- Remove and install undercarriage |
| **HMFP 106** | **Service, Diagnose, and Repair Trailers**<br>- Service, diagnose, and repair landing gear and trailer accessories<br>- Service, diagnose, and repair coupling systems<br>- Service, diagnose and repair trailer body components<br>- Service heating and refrigeration systems |
| **HMFP 107** | **Service, Diagnose, and Repair Heating, Ventilation, Air Conditioning**<br>- Describe heating and air conditioning fundamentals |
| **HMFP 108** | **Service, Diagnose, and Repair Engines and Supporting Systems**<br>- Service engine support systems<br>- Service diesel fuel supply systems<br>- Remove and install diesel engines |
| **HMFP 109** | **Service, Diagnose, and Repair Powertrains**<br>- Service clutches<br>- Service manual transmissions<br>- Service powershift and automatic transmissions<br>- Service drivelines<br>- Service drive axles<br>- Service final drives<br>- Remove and install transmissions<br>- Remove and install drivelines and differentials<br>- Remove and install final drives |
| **HMFP 110** | **Service, Diagnose, and Repair Structural Components and Accessories**<br>- Describe protective structures<br>- Service, diagnose, and repair cab structures |
| **HMFP 111** | **Use Communication and Mentoring Techniques**<br>- 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.

## Evaluation and Assessment:

**HEAVY MECHANICAL FOUNDATION**

| COTR COURSE | SUBJECT COMPETENCIES | THEORY WEIGHTING | PRACTICAL WEIGHTING |
|---|---|---|---|
| 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% |
| | **Total** | **100%** | **100%** |
| **In-School Theory/Practical Subject Competency Weighting** | | 30% | 70% |
| **Final in-school percentage score**<br>Students must achieve a minimum 70% overall as the final in-school percentage score | | **IN-SCHOOL %** | |

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:

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|---|---|
| **In-school percentage score**<br>Combined theory and practical subject competency | 80% |
| **Final Exam** | 20% |
| **Final percentage score** | 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

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.

**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 MW impedance
- Computer
- Reference manuals (as listed on third page)
- Pens, pencils, coloured pencils, three-ring binder, paper
- Calculator

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**Workplace Health and Safety Courses:**

Workplace Hazardous Material Information System (WHMIS: PVHE-700)

Basic First Aid – (PVHE-100)

**Workplace Health and Safety Courses Grade Scheme:**

| COM | NCG |
|---|---|
| Completed to the minimum defined standard | No credit granted – less than minimum defined standard |

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**Academic Policies:**

College of the Rockies policies related to courses can be found at https://cotr.bc.ca/about-us/college-policies/ and include the following:

- Policy 2.1.4 Course Audit
- Policy 2.4.1 Credential Framework
- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Rights, Responsibilities and Conduct
- Policy 2.4.8 Academic Performance
- Policy 2.4.9 Student Feedback and Concerns
- Policy 2.4.11 Storage of Academic Works
- Policy 2.5.3 Student Appeal
- Policy 2.5.5 Prior Learning Assessment and Recognition (PLAR)

## Program Grade

| COM | NCG |
|---|---|
| Completed to the defined standard – 70% or greater | No Credit Granted – less than 70% |

**Program Changes:**

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

**Industry Training:**

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

**Safety Catalog:**

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.