# Manitoba Grade 10 Automotive Technology Automotive Systems and Service (Course Code 8696)
# Course Outline

## Course Description

This course develops foundational automotive service skills through classroom learning and supervised shop practice. Students study safety, tools, materials, technical communication, and trade mathematics while learning to identify, describe, and perform basic repairs on engine systems, tires, wheels, hubs, and wheel bearings. Introductory electrical and hybrid-system awareness supports an understanding of modern vehicles.

## Course Objectives

- Demonstrate safe and responsible automotive shop practices.
- Use tools, measuring equipment, and lifting equipment correctly.
- Interpret basic service information and prepare work records.
- Apply fractions, decimals, percentages, and measurement skills.
- Select materials and consider their environmental impact.
- Identify mechanical, electrical, and hybrid-system components.
- Perform basic engine-system tasks with supervision.
- Inspect and service tires, wheels, hubs, and bearings.
- Describe and service tire pressure monitoring systems.
- Demonstrate communication, teamwork, and career awareness.

## Course Units

Unit hours are suggested planning allocations totalling 110 hours, including assessment and project work. Adjust to the school timetable. Safety, communication, mathematics, and environmental responsibility are reinforced throughout.

### Unit 1: Trade Safety and Shop Practices

Estimated Time: 12 hours

Topics:

- Workers' rights, responsibilities, and safe work procedures
- PPE, WHMIS, and hazardous materials
- SAFE hazard assessment and young-worker injury prevention
- Electrical isolation, fire safety, and emergency equipment
- Injury reporting and respectful workplace practices

Assessment: Safety test; shop safety demonstrations

## Unit 2: Careers and Technical Communication

Estimated Time: 10 hours

Topics:

- Automotive careers, apprenticeship, and Red Seal awareness
- Workplace competencies, inclusion, and accessibility
- Professional communication and active listening
- VIN, service information, technical bulletins, and labour guides
- Work orders, estimates, inspections, and job requirements

Assessment: Career assignment; sample work order

## Unit 3: Tools and Trade Mathematics

Estimated Time: 14 hours

Topics:

- Hand, portable power, stationary, and facility equipment
- Hoisting and lifting procedures and specifications
- Micrometers, calipers, and metric/imperial measurement
- Fractions, decimals, percentages, and signed numbers
- Measurement tolerances, torque specifications, and tool care

Assessment: Tool demonstration; measurement lab; calculations

## Unit 4: Materials and Consumables

Estimated Time: 8 hours

Topics:

- Selecting and storing fluids, lubricants, fasteners, and seals
- Manufacturer specifications and material compatibility
- Safe handling, spill prevention, and waste disposal
- Indigenous perspectives on sustainability and respect for resources
- Environmental effects of material selection and disposal

Assessment: Materials selection task; environmental reflection

## Unit 5: Engine and Vehicle Systems

Estimated Time: 20 hours

Topics:

- Engine terminology, hazards, and service tools
- Mechanical and electrical components and system operation
- Basic supervised engine service and repair procedures
- Identification of electrical and hybrid vehicle systems
- Manufacturer information and verification of completed work

Assessment: System identification test; engine service lab

### Unit 6: Tires and Wheels

Estimated Time: 20 hours

Topics:

- Tire types, components, and application
- Wheel construction, sizing, offset, and backspacing
- Tire and wheel hazards and equipment selection
- Inspection, repair, replacement, and safe installation
- Documenting condition and service completed

Assessment: Written quiz; tire and wheel service evaluation

### Unit 7: Hubs, Wheel Bearings, and TPMS

Estimated Time: 16 hours

Topics:

- Adjustable and non-adjustable hubs and bearings
- Inspection, service, and replacement procedures
- Direct and indirect tire pressure monitoring systems
- TPMS tools and manufacturer service procedures
- Supervised TPMS diagnosis and repair

Assessment: Bearing service lab; TPMS practical evaluation

### Unit 8: Basic Automotive Service Project

Estimated Time: 10 hours

Topics:

- Reviewing a service concern and planning the task
- Selecting specifications, tools, and materials
- Completing approved basic repairs
- Recording measurements and verifying operation
- Preparing a clear service report

Assessment: Service project; completed work order

## Assessment Breakdown

The weighting follows the supplied course-outline template; project tasks are adapted to this course.

| Component | Weight |
|---|---|
| Theory Tests & Quizzes | 25% |
| Practical Shop Skills | 35% |
| Labs & Assignments | 20% |
| Culminating Project | 10% |
| Employability & Safety Practices | 10% |

## Required Tools and Equipment

- PPE and automotive service information
- Hand tools, torque wrenches, and approved power tools
- Hoist or jack and stands appropriate to the task
- Calipers, micrometers, and metric/imperial measuring tools
- Engine and vehicle training equipment
- Tire changer, wheel balancer, and tire inspection tools
- Hub and bearing service tools
- TPMS service tool and appropriate scan tool

## Employability Skills

- Workplace safety and responsible decision-making
- Problem-solving, critical thinking, and creativity
- Clear communication, active listening, and teamwork
- Time management, organization, and independent learning
- Professional conduct, inclusion, and respect for others
- Environmental responsibility and global citizenship
- Career awareness within the automotive service industry

## Culminating Project

Students will complete a supervised basic automotive service project involving an engine-system task or tire, wheel, hub, bearing, or TPMS concern. They will use service information, select tools and materials, carry out approved work, verify the result, and submit a work order with measurements and findings.

## Recommended Prerequisite

Grade 9 Introduction to Automotive Technology is helpful but is not assumed to be required. This is a suggested preparation pathway, not a provincial prerequisite stated in the supplied curriculum.

## Curriculum Reference

Based on Manitoba's Grade 10 Automotive Systems and Service curriculum (Course Code 8696; supplied auto_gr10_eng.pdf).

Curriculum alignment: A1 Learning About Work; A2 Trade Safety Awareness; A3 Tools and Equipment; A4 Trade Related Communications and Documents; A5 Trade Related Mathematics; A7 Engine Fundamentals; A12 Tires, Wheels, Hubs and Wheel Bearings.