

POWERSPORTS TECHNOLOGY

DIPLOMA - 60 CREDITS

About this program

Students who wish to become skilled PowerSports mechanics must be capable of diagnosing mechanical failures quickly and accurately if they are to be in a position to repair a job at a fair salary return. Most types of two- and four-cycle small engines that are currently used to power lawn mowers, snowblowers, generators, garden tractors, rototillers, snowmobiles, ATVs, personal watercraft and marine engines will be covered. Students who perform satisfactorily may find employment as service technicians, sales personnel and factory representatives, or they may wish to enter business for themselves. This program requires a mechanical aptitude and the ability to read and comprehend technical service manuals, understand and perform a variety of diagnostic procedures, and work well with fellow employees and customers. Many industry training opportunities are available.

Program outcomes

1. Demonstrate safety and professionalism and related soft skills.
2. Apply the theory of vehicle operating systems.
3. Diagnose vehicle operating systems.
4. Repair vehicle operating systems.
5. Interpret service information.

Curriculum overview

Crds	Requirement type
54	Required courses
6	Restricted electives in course types
60	Total

Developmental courses note: A student may be required to enroll in developmental courses in reading, writing and math. A student's scores on the Accuplacer assessment will determine enrollment in developmental courses. The purpose of developmental courses is to prepare students for the demands of a college-level curriculum. *Credits may vary.*

Accreditation: Minnesota State Community and Technical College is accredited by the Higher Learning Commission, a regional accreditation agency recognized by the U.S. Department of Education. More information can be found at www.minnesota.edu/accreditation.

Curriculum requirement details

Required courses

Course	Crds
PWST1000 - Introduction to PowerSports	3
PWST1002 - Snowmobile, Off Road Vehicle and Motorcycle Maintenance	3
PWST1014 - Personal Watercraft and Marine Engine Maintenance	3
PWST1015 - Marine Engine Installation and Set Up	3
PWST1017 - Fuel Systems I	3
PWST1021 - Ignition, Charging and Starter Systems	3
PWST1025 - Fuel Systems II	3
PWST1080 - Snowmobile Engines	3
PWST1115 - Electrical Foundations	3
PWST2013 - Power Hydraulics	3
PWST2016 - Outboard Engine Systems	3
PWST2017 - Marine Drive Systems	3
PWST2115 - All-Terrain Vehicles Systems	3
PWST2206 - Chainsaws and Generators	3
PWST2210 - Snowmobile Clutch and Drive Systems ...	3
PWST2304 - Motorcycles I	3
PWST2308 - Advanced Snowmobiles	3
PWST2312 - Advanced Motorcycle Systems	3

Other requirements or restricted electives

6 credits from these Course Types:

- General Education w/MnTC Goals
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Course summaries

PWST1000 - Introduction to PowerSports (3 credits)

This course is the study of powersports occupational safety, shop orientation procedures, and power and hand tool usage. The use of shop equipment applications, fasteners, measuring instruments and service literature will be addressed, along with appropriate service department etiquette. Two- and four-stroke engine theory along with their proper lubricants will be covered.

PWST1002 - Snowmobile, Off Road Vehicle and Motorcycle Maintenance (3 credits)

This course is designed to train the student in proper maintenance techniques for on- and off-road land-based recreational vehicles. Students are encouraged to bring their personal recreational vehicle(s) or use the up-to-date industry products that the college offers or both. Trailer maintenance also will be covered. This is an excellent course for getting equipment ready for an upcoming winter or summer season.

PWST1014 - Personal Watercraft and Marine Engine Maintenance (3 credits)

This course is designed to train the student on proper maintenance techniques for water-based recreational vehicles. Students are encouraged to bring their personal boats, outboards or personal watercraft or use the up-to-date industry products that the college offers, or both. This is an excellent course for getting personal watercraft and boats ready for an coming spring.

PWST1015 - Marine Engine Installation and Set Up (3 credits)

This course will cover marine engine and drive systems: fundamentals, engine removal, engine installation and basic system testing.

PWST1017 - Fuel Systems I (3 credits)

The Fuel Systems I course covers the theory and operation of basic fuel systems and the fuels that they deliver. This is the first of two fuel systems courses and will give students the solid foundation they will need to understand the more advanced systems in their future course work.

PWST1021 - Ignition, Charging and Starter Systems (3 credits)

This course is a continuation of the Electrical Foundation course and will cover the study of electrical systems used on power sports equipment. It will focus primarily on ignition and starting systems. Students will learn and apply the theories of ignition, induction, charging and starting systems. Emphasis will be on proper use of test equipment along with the generation and flow of electricity. Students will apply the theories of ignition, induction, charging and starting systems.

PWST1025 - Fuel Systems II (3 credits)

Fuel Systems II is the second in a two-part course series covering two- and four-cycle off-road and marine products. Students will apply the theories of fuel system operation to both two- and four-stroke engines. Included in this course will be inspection and troubleshooting, along with seasonal service requirements and fuel quality testing.

Prerequisites:

PWST1080 - Snowmobile Engines (3 credits)

This course covers snowmobile engine designs, component identification and engine service procedures, as well as snowmobile fuel systems and service.

PWST1115 - Electrical Foundations (3 credits)

The Electrical Foundation course will cover the theory and practical operation of electricity. Multi-meters and test instruments will be used, giving students the solid foundation they will need to understand the more advanced electrical systems in their future course work.

PWST2013 - Power Hydraulics (3 credits)

This course covers the theory and service of hydraulic systems used on a wide range of off-road applications. Hydro-static transmissions, power steering and power trim system service will be performed. System troubleshooting as well as component service also will be included in this course.

PWST2016 - Outboard Engine Systems (3 credits)

Outboard Engine Systems introduces the fuel and electrical systems used on outboard motors. Primary focus will be on fuel and oil injection systems along with ignition, starting and charging systems. Students will learn the theories of operation and proper use of test equipment and repair.

PWST2017 - Marine Drive Systems (3 credits)

This course covers the operational theory and service of the outboard and sterndrive drive units. Gear ratios, drive shaft housing and gear cases will be investigated. Complete drive system disassembly, measurement, analysis, shimming and rebuilding will be performed.

PWST2115 - All-Terrain Vehicles Systems (3 credits)

All-Terrain Vehicles Systems focuses on various types of four-cycle ATV engine fuel and electrical systems. Students will also examine chassis and drive train components.

PWST2206 - Chainsaws and Generators (3 credits)

This course offers a comprehensive view of maintenance, diagnostics and post-repair inspections of chainsaws. This course also covers generator components and testing procedures. Students will test generator voltages and learn how to diagnose and repair generators. Students must have an understanding of electricity and electrical meter usage prior to taking this class.

PWST2210 - Snowmobile Clutch and Drive Systems (3 credits)

Snowmobile Clutch and Drive Systems identifies major components of the complete drive system and discusses maintenance, routine adjustment and tuning of the continuous variable transmission (CVT).

PWST2304 - Motorcycles I **(3 credits)**

This course focuses on various types of four-cycle motorcycle and ATV engines. Students will learn engine service and maintenance procedures. Students will also learn about motorcycle fuel systems and related components.

PWST2308 - Advanced Snowmobiles **(3 credits)**

Students will demonstrate troubleshooting skills. Students will perform electrical tests used in diagnosing electrical failures on snowmobiles. Students will learn and demonstrate a systematic approach to troubleshooting snowmobiles.

PWST2312 - Advanced Motorcycle Systems **(3 credits)**

This course is designed to test troubleshooting skills and knowledge. Students will be presented with motorcycle problems and, using a systematic approach, students will identify and repair the unit. This course is designed to simulate the role of a technician in a dealership. Students will be expected to write a work order, estimate repairs, make the repair and finalize the work order.



POWERSPORTS TECHNOLOGY DIPLOMA - 60 CREDITS

Program Plan — "Fall Start Students"

Locations: Detroit Lakes

1st Fall Term (15 credits)

Courses

Course	Crd
PWST1000 - Introduction to PowerSports	3
PWST1002 - Snowmobile, Off Road Vehicle and Motorcycle Maintenance	3
PWST1017 - Fuel Systems I	3
PWST1115 - Electrical Foundations	3
PWST2304 - Motorcycles I	3

1st Spring Term (15 credits)

Courses

Course	Crd
PWST1014 - Personal Watercraft and Marine Engine Maintenance	3
PWST1021 - Ignition, Charging and Starter Systems	3
PWST1025 - Fuel Systems II	3
PWST1080 - Snowmobile Engines	3

3 credits in one or more of the following:

General Education w/MnTC Goals

2nd Fall Term (15 credits)

Courses

Course	Crd
PWST1015 - Marine Engine Installation and Set Up	3
PWST2016 - Outboard Engine Systems	3
PWST2206 - Chainsaws and Generators	3
PWST2210 - Snowmobile Clutch and Drive Systems	3

3 credits in one or more of the following:

General Education w/MnTC Goals

2nd Spring Term (15 credits)

Courses

Course	Crd
PWST2013 - Power Hydraulics	3
PWST2017 - Marine Drive Systems	3
PWST2115 - All-Terrain Vehicles Systems	3
PWST2308 - Advanced Snowmobiles	3
PWST2312 - Advanced Motorcycle Systems	3