



Northwest Technical College
BEMIDJI, MN

Automotive Motorsports

High-Performance Engine Machining



Prepare for a career as a high-performance engine machinist building and repairing engines for the motorsports industry.

Program

High-Performance Engine Machining students gain the knowledge and skills to build high-performance engines for motorsports and racing. Extensive lab work includes:

- Advanced engine assembly
- Cylinder head porting
- Engine dynamometer (dyno) tuning, used to achieve desired torque and horsepower
- Lathe and mill operations
- Cylinder head machining
- Computer Numeric Control (CNC) engine block machining

In addition, students complete an introductory Motorsports Fabrication course, which incorporates tube bending, notching, multiple welding systems and lathe and mill operations.

Career opportunities

High-Performance Engine Machining graduates are qualified to pursue careers as pit crew mechanics or engine machinists in a variety of motorsports such as dirt track racing, NASCAR, circle track, rally racing and other race circuits. Graduates also work as machinists in industrial tool and die shops, including those shops specializing in engine and part fabrication for automotive, agricultural and recreational vehicles. NTC has job placements nationwide.

More information

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High-Performance Engine Machining

The NTC advantage

NTC automotive courses feature extensive hands-on learning using industry-standard equipment and cutting-edge technology.

A block of overlapping courses allows students to complete either the Automotive Service program or the High-Performance Engine Machining program and then go on to take additional courses to complete both degree programs. Likewise, the Automotive Chassis & Powertrain certificate and the Motorsports Technology diploma share course requirements. NTC is among a handful of colleges in the nation that offer the option to pursue these complementary programs at the same time. Completing multiple credentials gives students a competitive skill set and expanded employment opportunities in motorsports and commercial automotive service.

Required courses

NTC offers an Associate of Applied Science (AAS) degree, diploma and certificate options in its High-Performance Engine Machining program, as well as a diploma in Motorsports Technology and certificate in Automotive Chassis & Powertrain Systems. Diploma and certificate credits in motorsports and powertrain systems can be applied to the AAS degree or the diploma programs.

College readiness courses may be required in reading, writing and math based on performance on the Accuplacer assessment. Contact the Office of Admissions to schedule an assessment.

Automotive Chassis & Powertrain, certificate, 17

Course #	Course name	Credits
AMST 1001	Automotive Motorsports Basics	4
AMST 1002	Introduction to Automotive Electrical/Electronics	4
AMST 1003	Engine Theory/Service	4
AMST 1016	Brakes	4
*HPER 1410	First Aid/CPR	1

**Not required for the AAS degree. All other credits can be applied to the AAS or diploma in the High-Performance Engine Machinist program.*

Cylinder Head & Engine Machining, certificate, 17 credits

Course #	Course name	Credits
MOTO 2225	Motorsports Fabrication I	2
HPEM 1200	Lathe and Mill Operations	2
HPEM 1202	Cylinder Head Machining	4
HPEM 1204	Theory of Cylinder Head	2
HPEM 1206	Theory of Lower Engine Machining	2
HPEM 1207	Lower Engine Machining	5

High-Performance Engine Machinist, diploma, 49 credits

Requires all of the certificate courses and an additional 32 credits.

Course #	Course name	Credits
AMST 1001	Automotive Motorsports Basics	4
AMST 1002	Introduction to Automotive Electrical/Electronics	4
AMST 1003	Engine Theory/Service	4
AMST 1016	Brakes	4
*HPER 1410	First Aid/CPR	1
*HPEM 1305	Simulated Machine Shop	3
HPEM 1308	Engine Dyno Setup and Operations	3
HPEM 1350	Porting Heads for Performance Modifications	3
HPEM 1360	CNC Engine Block Machining	2
HPEM 1390	Advanced Engine Building Techniques	4

**Not required for the AAS degree.*

High-Performance Engine Machinist, AAS, 60 credits

Requires the diploma courses and an additional 15 credits.

Course #	Course name	Credits
ENGL 1111	College Writing I	3
MATH 1110	College Algebra	3
PSYC 1105	General Psychology	3
SPCH 1110	Intro to Public Speaking	3
	General education electives	3

Motorsports Technology, diploma, 49 credits

Requires all of the Automotive Chassis and Powertrain certificate courses and an additional 32 credits.

Course #	Course name	Credits
MOTO 1210	HP Welding	4
MOTO 1220	HP Drivelines	4
MOTO 1230	HP Chassis Repair	4
MOTO 2225	Motorsports Fabrication I	2
MOTO 2231	Motorsports Fabrication II	2
MOTO 1310	HP Suspensions	4
MOTO 1320	HP Chassis Setup	4
MOTO 1330	HP Fuel/Electronics/Ignitions	4
AMST 2800	Capstone	4

More information

Office of Admissions

(218) 333-6600 or (800) 942-8324
TTY: (218) 333-6691 or (800) 627-3529
admissions@ntcmn.edu



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Right Career. Right Now.

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