

EDUCATION  
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# 2021 RACE REPORT

VOLUME 13

SCHOOL OF AUTOMOTIVE  
MACHINISTS & TECHNOLOGY

# SAM TECH

SAMTECH.EDU



BLOCK | CYLINDER HEAD | CNC | EFI CALIBRATION | ASSOCIATE OF APPLIED SCIENCE

# SAM Tech PROGRAMS



**BLOCK MACHINING** The objective of the **Automotive Engine/Block Machining** program is to qualify the student as an automotive machinist/race team crew member. Although the actual machining process will be the emphasis of the program, a thorough education on theory of operation of the modern race engine will be presented. The student will explore the basic theory and concepts of internal combustion engine operation, then move into more specific and complex areas including cylinder pressure, airflow, volumetric efficiency, high RPM valve train geometry, and horsepower/torque as demonstrated on both engine and chassis dynos. Although no previous experience is required, this program is intended for the mechanically inclined student with a serious work ethic. Students will work directly on the School race cars, in the facility and at the track. They will be exposed to true race engines and drivetrains. This will include data acquisition, weather station correction factors, MSD ignition systems, EFI programming, carburetion tuning, clutch set-up, gear and converter combinations.

**CYLINDER HEAD MACHINING** The objective of the **Automotive Engine/Cylinder Head Machining** program is to train the student as a performance cylinder head machinist for the race engine industry. The theory and role of the cylinder head in the engine operation will be thoroughly covered in the classroom. Airflow characteristics and their effect on performance will be highlighted in all areas of this program. The complex relationship of flow bench numbers versus horsepower will be examined during lab hours. Students will learn the how and why of the many components of a cylinder head assembly. Intake manifold design from cast to fabricated sheet metal will be studied in terms of cubic inch and RPM range in relationship to cross sectional area and runner taper. The art of creating maximum efficiency and horsepower through precision component assembly combinations will be taught to the students. The knowledge learned will facilitate the student's success in the motorsports industry.



**CNC MACHINING** The program objective of the **CNC Machining** course is to qualify graduates to be capable of understanding and performing machining operations utilizing Computer Numerically Controlled Machining Centers. The program will include both classroom and hands-on lab instruction. The primary emphasis of this program will be the application of CNC machining techniques to improve performance of cylinder heads and engine blocks. Students will thoroughly explore the utilization of 5-Axis CNC Machining Centers as well as Coordinate Measuring Machine digitizing hardware and software applications and interfacing. Machine set-up, operation, and work piece preparation will be covered in detail. Special emphasis will be given to modification of high-performance and racing cylinder heads. Students will analyze and evaluate completed projects to quantify improvements, using racing industry standard equipment and techniques.

**EFI CALIBRATION** The objective for the **EFI Calibration** program is to qualify the student as an Automotive Performance Engine Tuner. The student will be capable of calibrating and troubleshooting the Engine Management System on the engine dynamometer, chassis dynamometer and at the racetrack. This program includes instruction in adding performance accessories, modifying power trains, tuning custom engines, suspension, exhaust systems, and using dynamometers and other diagnostic equipment. This program is intended for mechanically inclined students with a solid background in the mechanical system of an automotive engine and desire to extend that knowledge into the electronic control system in the automotive industry. The program will include both classroom and hands-on lab instruction. The student will learn and explore how to utilize various engine control software and dynamometers to alter engine operating parameters while observing the physical changes in real time. Specific tuning topics such as High Performance Naturally Aspirated, Turbo Charged, Supercharged, Nitrous, and data acquisition will be covered in detail. The student will learn to analyze and evaluate completed projects to quantify improvements, using racing industry standard equipment and techniques.



**ASSOCIATE OF APPLIED SCIENCE** The objective of the **Associate of Applied Science Degree** in Automotive Engine/Block & Cylinder Head Machining is to qualify the student as an automotive block and cylinder head machinist. In addition to the technical courses, students will take Introduction to Communication, College Algebra, Introduction to Physics, English Composition, and introduction to Sociology to complete the degree. The program provides an ideal foundation for professional development and continuing higher education. The addition of this degree program represents a significant, additional educational commitment by the school and a huge opportunity for the students. Former graduates of the **Automotive Engine/Block & Cylinder Head Machining** programs may return to school to complete the Associate of Applied Science Degree.

# SAM Tech Named Military Friendly School for Ninth Time



2021 is the Ninth straight year that SAM Tech has been designated a Military Friendly® School by Victory Media, the leader in successfully connecting the military and civilian worlds. The Military Friendly® Schools designation is awarded to colleges, universities, and trade schools in the country that are doing the most to embrace military students and to dedicate resources to ensure their success in the classroom and after graduation.

“Being named a Military Friendly School for nine years in a row is an honor of which we are very proud,” said Linda Massingill, Executive Director of the School of Automotive Machinists & Technology. “We appreciate all these veterans have sacrificed in defending this great country of ours. We are glad to be able to help them and their families in any way possible. We at SAM Tech understand the importance of continuing one’s education in an effort to find a career after military service.”

## SAM Tech Graduates In Action

While attending SAM Tech in Houston, Bryan Neelen met a classmate named Pecos Loughlin. The two aspiring engine builders hit it off and became friends, but they also had an entrepreneurial spirit. What began as simple port work on LS cylinder heads, has since become Late Model Engines, located in Houston, an engine machine shop that today ships out nearly 400 partial or complete engines a year. “We literally started with absolutely nothing,” LME co-owner Bryan Neelen says. “We did a bunch of cylinder heads, did this, sold that and bought a piece of equipment. We worked up another chunk of money and bought another piece of equipment. It wasn’t like we just took out a big loan and said, bam, we’re in business. We built it up slowly. It was a process. We’re now in 17,000 square feet, we’ve got 14 employees total. We break it down into our front office sales and marketing, our cylinder head department and our engine department and our CNC department. We pretty much have three businesses working in the shop. One is our partial and complete engines – short blocks and long blocks. Then, we have cylinder heads. And then we have all of our billet parts that we manufacture in-house.”



9 out of 20 employees are SAM Tech graduates



Late Model Engines co-owners Bryan Neelen (left) and Pecos Loughlin (right). Graduated SAM Tech in 1999.

of the best in our market, it just means a ton that our work is not only providing for our families, but giving people the ability to go racing and do what they love. It’s pretty awesome and we love it every day.”

While the shop’s expertise and capabilities have continued to grow, LS and LT engines have remained the shop’s bread and butter when it comes to engine building. However, Neelen says they’ve been testing the new 6.6L LT, have a deal in place with an NHRA team going forward and are intrigued by Ford’s new Godzilla engine – all of which will keep LME pushing the envelope.

As Late Model Engines closes in on 20 years in business, the shop continues to showcase quality machining, components and engines for the ultimate in performance, and for that, Engine Builder congratulates Late Model Engines on being the 2020 America’s Best Engine Shop in the Race category.

# CLASS Projects:



**2012 COPO 8.90@150.16 MPH**  
NHRA National Record Holder FS/X



**2016 Cobra Jet 8.62@156.10 MPH**  
Driver Austin Ford / Owner Chuck Parker



**1957 Bel Air Built by SAM Tech students in 56 days**  
Featured in Hot Rod Magazine & PowerNation TV



**2016 COPO 7.97@173 MPH**  
Owner/Driver Glenn Pushis • Crew Chief Doug Thompson  
Car Chief Steve Hilterbrand • Crew Mike Blamer



**1967 Shelby 10.33@127.58 MPH NHRA C/SA**  
Driver Heather Ford Park



**Nostalgia Funny Car 4.57@154 MPH**  
Owner Dooley and Sons  
Driver Jeff Cameron



**1972 Oldsmobile 455 10.83@119.68 MPH**  
Owner/Driver Brandon Bakies  
2019 NHRA Fall Nationals Stock Champion



**Jud's 1969 Z28 Chevrolet Camaro SBC**  
Built and showcased on "Engine Power."  
• 366 HP @ 6800 • 332 TQ @ 5300



**1967 Shelby 10.33@127.58 MPH NHRA C/SA**  
Driver Austin Ford

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