NOVA Automotive
Training for your future 2017-18
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"Today's auto technicians need to be master diagnosticians, well versed in electronics, and have smooth customer service skills."

The automotive industry accounts for about 6% of all employment positions in the global economy. Whether you are looking for a local job, one across the country or around the world, automobiles are there. Qualified people are needed to repair, test, design, sell, and manage all aspects of this industry.

"The profession is being revolutionized," notes former ASE President Ronald Weiner. "Brute force has been supplanted by brain power. If you don’t think so, just look under the hood of one of today's sport coupes or SUVs. This is rocket science - or very close to it. Today's auto technicians need to be master diagnosticians, well versed in electronics, and have smooth customer service skills."

We train you to be a technician while preparing you for the many opportunities available for graduates with an Associate Degree in Automotive Technology. Manufacturers, fleet services, and independent shops are looking for well-trained people to fix high tech systems in today's cars as well as perform research & development, manage businesses, and engage customers. Students may eventually choose to become self-employed or own their own business.

We work with select Colleges and Universities that build upon our AAS degree for a Bachelors degree in management or advanced automotive technology.
The International Association of GM ASEP program has been apart of NOVA since 1981. This accelerated, structured, cooperative program was designed to incorporate real world experience with the same technical training technicians receive through their dealer. Students graduating from this program will earn 80% of their General Motors Certifications, an Associate in Applied Science Degree, and become an asset to the employer who trained them.  

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Our Global Automotive programs are designed to take you as far as you desire while earning your Associates in Applied Science Degree. All instructors hold decades of field experience, vast training, and employ the most efficient instructional techniques to provide the guidance you need. Instruction, coupled with the latest technology currently being employed in the field, challenge each student to their fullest potential.  

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The Collision Repair program is run by two expert instructors with over 30+ years of field experience. They will guide you through this 1-year certificate program that covers principles and practice of sheet metal operations, welding, body repair, paint preparation and paint application. You will be using the latest up to date equipment used in the field including a new paint booth, welders and laser measuring system.  

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The Diesel Mechanics Technology Certificate curriculum is designed to introduce the fundamentals of Diesel Equipment system repair to include: diesel engine and fuel, hydraulics/pneumatics, electrical, powertrain, steering and suspension and truck brakes. The diesel program will give graduates a practical background in basic diesel equipment technology principles. With the increase in diesel powered vehicles, trained diesel technicians are always in demand.  

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Our Welding program is taught by Mr. Matt Wayman who brings welding expertise and creativity. He will guide you through this 1-year certificate program that covers oxyacetylene, arc, inert gas, and the semi-automatic welding processes with our latest up to date equipment. The courses are structured to allow students to pursue this certificate on a part time basis and pursue apprenticeships or laboratory assistant positions.  

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Students choose GM ASEP because ASEP offers:

- Faced paced curriculum
- Co-op internship experience
- Job placement assistance
- 80% of GM Certifications
- AAS in Automotive Technology
- All classes are taken as a cohort

GM ASEP is a structured two-year program available only at the Alexandria campus that provides students with classroom instruction, hands on training, and work experience over 2 years. Many students become line technicians when they graduate.

For 8 weeks of the semester students are in school, and the other 8 weeks they’re working at a sponsoring dealer or AC Delco independent shop as a paid apprentice technician. We assist in the employment process by helping students with resume revision and interview skills before applying at one of our partner shops.

There are multiple shops across our region looking for the brightest minds that will lead them into the future. Employers are often ready to hire before classes begin.

For more information, please contact Keith Brown at keibrown@nvcc.edu or 703.845.4623.
We use NATEF curriculum along with GM specific training over the web, and the latest equipment currently used in the field. This prepares you for the other 8 weeks of the program, when you are working at your sponsoring shop, gaining real world, practical experience.

As an added bonus, students take all classes, automotive or not, together as a cohort so you won’t be the only one passionate about cars in your general education classes. This also allows us to work closely with the general education instructors to ensure they understand your top priority is becoming a technician and how they can cater their classes to you.

**FIRST SEMESTER (FALL)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Engines 1</td>
<td>AUT 111</td>
<td>4</td>
</tr>
<tr>
<td>Electricity 1</td>
<td>AUT 241</td>
<td>4</td>
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<tr>
<td>Brakes</td>
<td>AUT 265</td>
<td>4</td>
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<tr>
<td>Business and Professional Communications</td>
<td>CST 227</td>
<td>3</td>
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<tr>
<td>College Success Skills</td>
<td>SDV 100</td>
<td>1</td>
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<tr>
<td>Cooperative Education</td>
<td>AUT 297</td>
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**SECOND SEMESTER (SPRING)**

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<thead>
<tr>
<th>Course</th>
<th>Code</th>
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<tbody>
<tr>
<td>Engines 2</td>
<td>AUT 112</td>
<td>4</td>
</tr>
<tr>
<td>Electricity 2</td>
<td>AUT 242</td>
<td>4</td>
</tr>
<tr>
<td>Steering &amp; Suspension</td>
<td>AUT 266</td>
<td>4</td>
</tr>
<tr>
<td>Survey of Applied Physics</td>
<td>PHY 130</td>
<td>3</td>
</tr>
<tr>
<td>Cooperative Education</td>
<td>AUT 297</td>
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**THIRD SEMESTER (SUMMER)**

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<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Automotive Climate Control</td>
<td>AUT 236</td>
<td>4</td>
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<tr>
<td>Technical Writing</td>
<td>ENG 131</td>
<td>3</td>
</tr>
<tr>
<td>Cooperative Education</td>
<td>AUT 297</td>
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**FOURTH SEMESTER (FALL)**

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<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>Power Trains 1</td>
<td>AUT 141</td>
<td>4</td>
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<tr>
<td>Fuel Systems 1</td>
<td>AUT 121</td>
<td>4</td>
</tr>
<tr>
<td>Humanities Elective</td>
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<td>3</td>
</tr>
<tr>
<td>Cooperative Education</td>
<td>AUT 297</td>
<td>2</td>
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**FIFTH SEMESTER (SPRING)**

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<tr>
<th>Course</th>
<th>Code</th>
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<tbody>
<tr>
<td>Fuel Systems 2</td>
<td>AUT 122</td>
<td>4</td>
</tr>
<tr>
<td>Power Trains 2</td>
<td>AUT 142</td>
<td>4</td>
</tr>
<tr>
<td>Electronics</td>
<td>AUT 245</td>
<td>4</td>
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<tr>
<td>Social Science Elective</td>
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<tr>
<td>Cooperative Education</td>
<td>AUT 297</td>
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Students choose the Global Automotive program because Global offers:

- Flexible course schedules
- Part-time options
- Available at both campuses
- Multiple manufacturer technologies
- Variety of employment options while studying

The global automotive program encompasses multiple manufacturer technologies, and places emphasis on best practice diagnostics & resources. Global courses include a lecture & lab and normally run for 16 weeks of the semester.

Dealers, independent shops, and other employers contact us regularly looking for all levels of students. They routinely ask for responsible students who have a good work ethic and are in the process of completing their associate degree.

All instructors at both campuses have many years of experience in the automotive industry in various facets. Students learn from business owners, engineers, machinists, race enthusiasts, shop foremen, service managers, and last but not least, technicians.

To find out more, please contact Laura Garcia at the Alexandria campus at 703.933.8375 or John Hicks at the Manassas Campus at 703.530.8254.
We utilize the industry recognized NATEF curriculum along with the latest equipment currently used in the field to ensure you get the best technical education. Technical skills coupled with a higher understanding of culture and economics positions our students for the greatest degree of success. Below is the outline of courses that should be taken in each semester.

**FIRST SEMESTER (FALL)**

- **Introduction to Automotive Shop Practices** AUT 100 2 Credits
- **Engines 1** AUT 111 4 Credits
- **Electricity 1** AUT 241 4 Credits
- **College Composition 1** ENG 111 3 Credits
- **College Success Skills** SDV 100 1 Credit

**SECOND SEMESTER (SPRING)**

- **Electricity 2** AUT 242 4 Credits
- **Brakes** AUT 265 4 Credits
- **Steering & Suspension** AUT 266 4 Credits
- **Liberal Arts Math** MTH 151 3 Credits
- **OR**
  - **Survey of Applied Physics** PHY 130 3 Credits

**THIRD SEMESTER (SUMMER)**

- **Automotive Climate Control** AUT 236 4 Credits
- **Fuel Systems 1** AUT 121 4 Credits

**FOURTH SEMESTER (FALL)**

- **Engines 2** AUT 112 4 Credits
- **Fuel Systems 2** AUT 122 4 Credits
- **Power Trains 1** AUT 141 4 Credits
- **Humanities/Fine Arts Elective - Recommend**
- **History of Western Civilization 2** HIS 102 3 Credits

**FIFTH SEMESTER (SPRING)**

- **Power Trains 2** AUT 142 4 Credits
- **Electronics** AUT 245 4 Credits
- **Intro to Communications** CST 110 3 Credits
- **Social Science Elective - Recommend**
- **Principles of Macroeconomics** ECO 201 3 Credits
Students choose collision repair because collision offers:

- A great field for those with an artistic, creative eye who loves cars
- Short one year certificate to graduate
- Part-time options
- Heavily hands-on based learning

Graduates may find themselves working as a metal, structural, refinishing or detailing technician, estimator and eventually working up to become a manager or owner of a shop. There are also other fields such as glass replacement, parts suppliers and paint suppliers who require staff with knowledge of the collision repair industry.

Throughout the program, students learn all aspects of the collision repair industry from the initial damage evaluation to the final detailing. Hands-on projects such as: performing sheet metal repairs, welding, disassembling and reassembling components, and refinishing body panels is the main mode of instruction. Students also gain familiarization and practice in frame alignment using our state of the art laser frame aligner.

For more information about the collision repair program, please contact Geoffrey Brown at 703.845.6475 or gbrown@nvcc.edu.
Our instructors are I-CAR certified and follow I-CAR curriculum to provide the formal training that many employers seek. Technical skills coupled with training in communication skills affords our students the greatest degree of success. Below is the outline of courses that should be taken in each semester.

**FIRST SEMESTER (FALL)**

**Introduction to Automotive Shop Practices**

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<th>Course</th>
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<td>AUT 100</td>
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Prerequisite or co-requisite for all automotive courses. Introduces shop practices for automotive laboratory and shop safety, identification and use of hand tools, general power equipment, and maintenance of automotive shop. Explains basic operation procedures of standard shop equipment. Presents Occupational Safety and Health Act standards pertaining to the automotive field.

**Basic Sheet Metal Operations**

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<tr>
<td>AUB 106</td>
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Teaches the use of metal straightening tools, basic straightening operations, shrinking, filling, sheet metal damage, and repair procedures.

**Paint Preparation**

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<th>Course</th>
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<td>AUB 118</td>
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Teaches auto body preparation for painting, using the materials, processes, and equipment required to prepare metal and old finishes for painting. Includes sanding, cleaning, solvents, special materials, fillers, and primers.

**Introduction to Communication**

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<tr>
<td>CST 110</td>
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Examines the elements affecting speech communication at the individual, small group, and public communication levels with emphasis on practice of communication at each level.

**SECOND SEMESTER (SPRING)**

**Painting**

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<th>Course</th>
<th>Course Code</th>
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<tr>
<td>AUB 119</td>
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Teaches theory and application of painting and the use of painting equipment. Also discusses application of materials, paints, thinners, primers, rubbing compounds, and cleaners.

**Body Welding**

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<th>Course</th>
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<tr>
<td>AUB 145</td>
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Presents the principles involved in using heat to relieve stress in shrinking metal, as well as, the processes used in joining high and low strength steels. Includes oxyacetylene welding, cutting, brazing, and soldering, resistance spot welding, and MIG welding.

**THIRD SEMESTER (SUMMER)**

**Auto Body Repair**

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<tr>
<th>Course</th>
<th>Course Code</th>
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<tr>
<td>AUB 116</td>
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Teaches collision straightening procedures and use of equipment, planning repair procedures, disassembly techniques, body fastening systems, panel repair, and alignment.
The Diesel Mechanics Technology Career Studies Certificate curriculum is designed to introduce the fundamentals of diesel equipment repair and provide instruction in hydraulic systems, diesel engine overhaul and tune-up, electrical circuits, power train maintenance and fuel injection.

The Diesel Mechanics Technology program will give graduates a practical background in basic diesel equipment technology principles. The curriculum provides practical training and the option of on-the-job experience through cooperative education. The demand for trained diesel mechanic personnel and technicians is increasing.

The Diesel Mechanics Technology Career Studies Certificate curriculum prepares graduates for employment in any of the following occupations: Diesel Equipment Repair, Diesel Truck Repair, Supervisor, Shop Foreman, Heavy Duty Repair, Purchasing Agent, Salesperson, Power Train Repair, Fuel Injection Repair, Diesel Engine Repair, Automotive Diesel Repair and Marine Diesel Repair.

For more information about the diesel program, please contact Gary Phares at 703.257.6676.
FIRST SEMESTER (FALL)

Introduction to Diesel Engine  
DSL 111  
2 Credits
Studies the modern diesel engine, including its fuel, cooling, induction, and exhaust systems. Covers construction, fabrication, maintenance, tune-up, and minor repair and adjustment.

Transportation Electrical Systems  
DSL 141  
4 Credits
Studies basic operational theory of electrical systems used in public transportation vehicles. Covers electrical symbols, schematics, troubleshooting procedures, as well as the function, construction, and operation of the electrical system and its components.

Diesel Power Trains 1  
DSL 153  
3 Credits
Focuses on manual, hydrostatic, and heavy-duty automatic transmissions. Examines various types of power trains and their components, such as multidisc clutch, multi-speed transmissions, torques, drive lines, and differentials. Includes disassembly and assembly of various components. Part I of II.

Technical Writing  
ENG 131  
3 Credits
Offers a review of organizational skills including paragraph writing and basic forms of technical communications, various forms of business correspondence, and basic procedures for research writing. Includes instruction and practice in oral communication skills.

Intro to Communications  
CST 110  
3 Credits
Examines the elements affecting speech communication at the individual, small group, and public communication levels with emphasis on practice of communication at each level.

College Success Skills  
SDV 100  
1 Credit
Assists students to make a successful transition to college. Provides students with the academic tools for success and teaches the skills of self-management and self-responsibility that relate to being a successful student. Helps students learn how to make responsible choices about their academic, personal, and career goals. Provides information about the College and community resources, the College's policies and procedures, and the processes of moving effectively through the educational system.
This curriculum is designed for persons wishing to obtain fundamental skills for immediate entry-level positions in the welding trade as welding apprentices or welding laboratory assistants. Its structure allows students to pursue these courses on a part-time basis. All courses will apply to the Welding certificate program.

For more information about the welding program, please contact Matt Wayman at 703.530.3002 or mwayman@nvcc.edu.

From top left: A student welding a steel race frame, intricate metalwork on a bench, a gate, and the welding room.
COURSES for WELDING CERTIFICATE

FIRST SEMESTER (FALL)

Technical Writing  ENG 131  3 Credits
Offers a review of organizational skills including paragraph writing and basic forms of technical communications, various forms of business correspondence, and basic procedures for research writing. Includes instruction and practice in oral communication skills.

OR

Intro to Communications  CST 110  3 Credits
Examines the elements affecting speech communication at the individual, small group, and public communication levels with emphasis on practice of communication at each level.

Introduction to Welding  WEL 120  2 Credits
Introduces history of welding processes. Covers types of equipment, and assembly of units. Stresses welding procedures such as fusion, non-fusion, and cutting oxyacetylene. Introduces arc welding. Introduces MIG welding. Emphasizes procedures in the use of tools and equipment.

Arc Welding  WEL 121  2 Credits
Studies the operation of AC and DC power sources, weld heat, polarities, and electrodes for use in joining various alloys by the SMAW process. Covers welds in different types of joints and different welding positions. Emphasizes safety procedures

SECOND SEMESTER (SPRING)

Welding 2 (Electric Arc)  WEL 122  3 Credits
Teaches electric arc welding, including types of equipment, selection of electrodes, safety equipment and procedures, principles and practices of welding.

Welding Drawing and Interpretation  WEL 150  2 Credits
This course will instruct the student in how the welding blueprint is developed and how it is used to fabricate various products. The course will cover the basic weld symbols and how they are applied to the welding blueprint. The student will learn the various joints and their application to the welding process.

THIRD SEMESTER (SUMMER)

Inert Gas Welding  WEL 130  3 Credits
Introduces practical operations in the uses of inert-gas-shield arc welding. Discusses equipment, safety operations, and practices welding with various equipment and appropriate applications in manual and semi-automatic welding.

Semi Automatic Welding Processes  WEL 160  3 Credits
Introduces semi-automatic welding processes with emphasis on practical application. Includes the study of filler wires, fluxes, and gases.
Maintaining low tuition costs while going to school is the best platform for financial success. We not only provide low tuition rates, but tuition is paid per semester and there are no contract fees. Financial aid, scholarships, loans, & payment plans are also available. We encourage each and every student to fill out the Free Application for Federal Student Aid at www.fafsa.ed.gov.

Many students also take advantage of multiple part-time job opportunities while studying to pay for their tuition while gaining industry experience.

Tuition rates are updated every year, so please see our website for the most recent cost per credit hour. Books and parking are not included in the tuition rate since they vary depending upon the classes chosen, but all professors make a concerted effort to keep the cost of required materials low. Classes can be paid for by credit card through myNOVA or by check, money order, or cash at any campus business office. In order to receive the best financial opportunities, please get started in the enrollment process and sign up for classes as far in advance as possible.

Another opportunity that many students may take advantage of is the tool discount. Full time students can purchase tools from Snap-On and Matco at a discount between 30% - 52% off retail pricing. Craftsman and other tool retailers also offer student discounts as well. Our tool representatives regularly make appearances at both campuses to help answer any questions. We encourage students to build their tool collection over time as their skill set and income level increases.
Becoming a College Student

We understand it can be difficult to navigate through the process of becoming a college student, and we are here to help. We prefer you meet with a faculty advisor to help you through the process and answer any questions you may have.

Here is an outline of the process we can guide you through:

1. Enroll as a NOVA student. It’s free and is easily done online at: https://apply.vccs.edu

2. Fill out and submit the Free Application for Federal Student Aid (FAFSA) form at: www.fafsa.ed.gov

3. Take the English and Math placement tests. These can be done at any NOVA testing center. Be sure to check their webpage for more information about the tests. http://www.nvcc.edu/testing/placement.html


When you are ready to register for classes:

1. Meet with a faculty advisor before choosing classes. We normally follow the program path outlined in the college catalog, but may recommend different courses based upon your individual needs. http://www.nvcc.edu/catalog/cat2015/academics/programs/default.aspx

2. Be sure to enroll in developmental English or Math courses in the first semester if needed.

3. Plan on completing a Student Development (SDV) course in the first year.

4. Register for all classes by 11:59 p.m. on the day before the session begins. Keep in mind that a session normally starts before the start of classes, and our courses do fill up quickly.

For future GM ASEP students:

1. Please submit your driving record to Keith Brown at keibrown@nvcc.edu to ensure your employment eligibility.

2. Complete the mechanical aptitude test at the Alexandria campus testing center.

E-mail automotive@nvcc.edu for more information or Visit our website at www.nvcc.edu/automotivetechnology
Transfer Opportunities

Institutions that offer four-year automotive degrees often count most, if not all of our associate degree credits toward their bachelor degree program. If you are hoping to one day complete a 4-year degree, please speak with one of our faculty members about which courses to take each semester to ensure you will transfer successfully.

All degree options are 2+2 majors. That means these degrees are designed to match our 2 year automotive associates program so you can enter as a junior. Some colleges also have in-state tuition options.

Institutions currently accepting our credits are:

**Ferris State University in Big Rapids, Michigan**

Currently offering:
- Bachelor of Science, Automotive Management
- Also offers Automotive Engineering as a 0+4 major that many students have chosen to pursue

**Weber State University in Ogden, Utah**

Some Classes Available Online

Currently offering:
- Bachelor of Science, Automotive Technology – Field Service Operations Emphasis (online option)
- Bachelor of Science, Automotive Technology – Advanced Vehicle Systems
- Option to minor in Professional Sales

**Pennsylvania College of Technology**

Online Option Available

Currently offering:
- Bachelor of Science, Automotive Technology Management (online option)

Contact Laura Garcia for more information about transfers at:
(703) 933-8375 Phone or via email at lgarciamoreyra@nvcc.edu
If using a GPS, enter 5098 Dawes Avenue, Alexandria, VA 22311. This will take you to the entrance of the Automotive Courtyard area behind the AE Engineering building where you can park during a visit.

From 395:
Take Exit 4 – Seminary Road West
Go through 3 traffic lights
Turn right at the 4th traffic light onto Dawes Avenue
Pass the parking garage on your left and go straight at the 4 way stop
Turn left into the Automotive Courtyard just past the end of the AE Engineering Building
Enter into the tool room #117 and let an available faculty or staff member know where you parked
From I-66:
Take Exit 47 B (234 North)
Make a left onto Route 234 (Sudley Road) going north
Go through the traffic light on Battleview Parkway
Turn right at the campus marquee

Driving East on Route 29
Proceed east on Route 29 (Lee Highway) to Route 234 (Sudley Road)
Turn right onto Route 234 going south
Pass the Manassas National Battlefield Park Visitor’s Center on your left
Do not take the next left at the campus marquee
Proceed to the traffic light at Battleview Parkway and turn left
Take the first left on NOVA Way after the Country Inn & Suites and Fairfield Inn

Driving West on Route 29
Proceed west on Route 29 (Lee Highway) to Route 234 (Sudley Road)
Turn left onto Route going south
Pass the Manassas National Battlefield Park Visitor’s Center on your left
Do not take the next left at the campus marquee
Proceed to the traffic light at Battleview Parkway and turn left
Take the first left on NOVA Way after the Country Inn & Suites and Fairfield Inn

Driving South on Route 29
Proceed south & west on Route 28 (Centreville Road) to Route 234 (Sudley Road)
Turn right on Route 234 going north
Drive approximately 5.1 miles through Manassas
After Battleview Parkway, turn right at the campus marquee
# Auto Course Descriptions

**Engines 1**

Aut 111 4 Credits
The course will introduce the student to the operation, diagnosis and repair of the internal combustion engine, timing, and components. Support systems such as cooling, lubrication, intake and exhaust are covered in-depth.

**Engines 2**

Aut 112 4 Credits
Continuation of Engines 1, presents analysis of power, cylinder condition, valves, and bearings in the automotive engine to establish the present condition, repairs, or adjustments.

**Fuel Systems 1**

Aut 121 4 Credits
Emphasizes diagnostic test procedures and equipment for fuel system diagnosis and repair. Other topics include general engine diagnosis, exhaust systems, basic emission systems, and vapor management.

**Fuel Systems 2**

Aut 122 4 Credits
Continuation of fuel systems 1, emphasizing detailed analysis, diagnostics and repair. Includes identifying sources of technical data, diesel fuel injection, electronic fuel injection, engine management systems, and enhanced emission systems.

**Power Trains 1**

Aut 141 4 Credits
Emphasizes principles of operation, maintenance, diagnosis, and repair of manual transmissions, transaxles, clutches, drive shafts, CV axles, and differential systems.

**Power Trains 2**

Aut 142 4 Credits
Emphasizes automatic transmission theory, operation, maintenance, diagnosis, and repair. Topics include torque converters, planetary gear sets, and hydraulic principles.

**Automotive Climate Control**

Aut 236 4 Credits
Introduces principles of refrigeration, air conditioning controls, and adjustment and general servicing of automotive air conditioning systems.

**Electricity 1**

Aut 241 4 Credits
Emphasizes a basic understanding of fundamental electrical theories, terminology, definitions, equipment, diagnostics, and repair. The student will develop an understanding of starting and charging systems, lighting systems and wiring diagrams.

**Electricity 2**

Aut 242 4 Credits
Emphasis on automotive accessory systems. Detailed trouble shooting diagnosis and repair procedures. This course will also cover electronic ignition systems, electronic engine controls, and introduction to oscilloscope use.

**Electronics**

Aut 245 4 Credits
Introduces field of electronics as it applies to the modern automobile. Emphasizes basic circuit operation, diagnosis and repair of digital indicator and warning systems.
Auto Course Descriptions

**Brakes**
- AUT 265  

**Steering & Suspension**
- AUT 266  
  Introduces use of alignment equipment in diagnosing, adjusting, and repairing front and rear suspensions. Topics include maintenance, diagnosis, and repair of power and standard steering systems.

**Cooperative Education (GM ASEP Only)**
- AUT 297  

**Intro to Communications**
- CST 110  
  Examines the elements affecting speech communication at the individual, small group, and public communication levels with emphasis on practice of communication at each level.

**Composition**
- ENG 111  
  Introduces students to critical thinking and the fundamentals of academic writing. Writing activities will include exposition and argumentation with at least one researched essay.

**Technical Writing**
- ENG 131  
  Offers a review of organizational skills including paragraph writing and basic forms of technical communications, various forms of business correspondence, and basic procedures for research writing.

**Humanities/Fine Arts Elective - Recommend**
- HIS 102  
  Surveys the general history of the Western world from about 1600 CE to the present and allows students to reach a basic understanding of the characteristic features of the Western world's historical development in that span of time.

**Social Science Elective - Recommend**
- ECO 201  
  Introduces macroeconomics including the study of Keynesian, classical, monetarist principles and theories, the study of national economic growth, inflation, recession, unemployment, financial markets, money and banking, the role of government spending and taxation, along with international trade and investments.

**Survey of Applied Physics**
- PHY 130  
  Surveys topics such as heat, electricity, and light with emphasis on practical applications.

**OR**
- PHY 101  
  Introduction to Physics

**OR**
- MTH 151  
  Mathematics for the Liberal Arts 1