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**STATEWIDE ARTICULATION AGREEMENT  
BETWEEN  
THE COMMUNITY COLLEGE OF BALTIMORE COUNTY  
AND THE  
MARYLAND STATE DEPARTMENT OF EDUCATION  
ON BEHALF OF LOCAL SCHOOL SYSTEMS**

*This articulation agreement can be used for students enrolling in the: Automotive Technology AAS Degree program at The Community College of Baltimore County (CCBC).*

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Maryland State Department of Education (MSDE) and The Community College of Baltimore County (CCBC) enter into this articulation agreement in order to facilitate the enrollment of students from the Maryland Career and Technology Education (CTE) Program of Study in **Automotive Technology** National Automotive Technicians Education Foundation (NATEF), CIP 47.0645 into CCBC’s Automotive Technology Comprehensive program. Both parties agree to annually review the document and update as appropriate.

Subject to terms of this agreement, a student who successfully completes the approved Maryland CTE Program of Study in Automotive Technology/NATEF, CIP 47.0645: Brakes (1 credit), Electrical/Electronic Systems (2 credits), Engine Performance (1 credit), Suspension and Steering (1 credit) will be granted articulated credit at CCBC for the following courses:

|                      |                 |   |                   |
|----------------------|-----------------|---|-------------------|
| •                    | AUTO 126        | Repairing Automotive Brakes Systems                         | 4 credits         |
| •                    | AUTO 131        | Servicing Automotive Electrical and Electronic Systems      | 5 credits         |
| •                    | AUTO 141        | Servicing Automotive Engines and Related Systems            | 5 credits         |
| •                    | <u>AUTO 171</u> | <u>Repairing Automotive Steering and Suspension Systems</u> | <u>4 credits</u>  |
| <b>Total Credits</b> |                 |   | <b>18 credits</b> |

**Note:** All programs eligible to participate in the Articulation Agreement must be currently NATEF certified.

**The terms of this agreement are as follows:**

**Maryland Local Schools Systems will:**

- Offer the Maryland Career and Technology Education (CTE) Program of Study in Automotive Technology/NATEF, CIP 47.0645, as stated in the Maryland CTE program proposal as attached;
- Communicate details of this agreement to principals, teaching staff, guidance personnel, students and parents and/or guardians; and
- Maintain NATEF program certification.

**Full or partial articulated credit will be awarded based on the following when students:**

- Complete all required courses of the entire Maryland CTE Automotive Technology/NATEF Program of Study with a grade of B or better: Brakes, Electrical/Electronic Systems, Engine Performance and Suspension and Steering;
- Sit for and pass the National Automotive Student Skills Standards Assessment (NA3SA) end-of-course exams: Brakes, Electrical/Electronic Systems, Engine Performance and Suspension and Steering. Articulation credit will only be awarded for the exams passed;
- Provide a copy of their official NATEF/NA3SA student certification to CCBC prior to August 1<sup>st</sup> of the academic year;
- Meet the admission dates, procedures that apply to all new students at CCBC, and current college policies on Advanced Credit; and
- Apply to CCBC within three years of high school graduation.

**The Community College of Baltimore County will:**

- Arrange meetings, as requested, with faculty and students on the Maryland NATEF Program school campuses to provide information and assistance in matriculating at CCBC;
- Supply MSDE and local school systems with promotional literature that will be used to assist students with the application and/or transfer process;
- Communicate details of this agreement to staff in admissions, academic affairs, and faculty;
- Award the appropriate number of academic and/or technical credits, as specified in this agreement, upon review of the student's transcript and completion of the application process;
- Notify student of credits awarded; and
- Provide a list of student credits awarded to MSDE each spring.

**Maryland State Department of Education will:**

- Communicate details of this agreement with local school systems via CTE Directors;
- Confirm programs participating in the articulation agreement are currently NATEF certified;
- Provide CCBC with a list of centers (and their feeder schools) offering approved Maryland CTE Programs of Study in Automotive Technology/NATEF, CIP 47.0645 annually; and
- Provide CCBC with a list of CTE Directors annually.

## Automotive Technology Program Articulated Credit Map

| High School Program of Study  |                           |                             |   |  |
|---|---------------------------|-----------------------------|---|--|
| Requirements  | Grade 9                   | Grade 10                    | Grade 11                                  | Grade 12   |
| English – 4   | English 9                 | English 10                  | English 11                                | English 12   |
| Social Studies – 3  | US Government             | World History               | US History                                |  |
| Mathematics – 4   | Algebra 1                 | Geometry                    | Algebra 2                                 |  |
| Science – 3   | Physical Science          | Biology                     | Chemistry                                 |  |
| Physical Education - .5<br>Health Education - .5                            | .5 PE                     | .5 Health                   |   |  |
| Fine Arts – 1   | .5 Fine Arts              | .5 Fine Arts                |   |  |
| Technology Education – 1  | Foundations of Technology |                             |   |  |
| CTE Completer Program – 5<br>* Concentrator course<br>** Work Base Learning |                           |                             | Suspension and Steering (1)<br>Brakes (1) | *Electronic/Electrical Systems (2)<br>Engine Performance (1) (**WBL) |
| Foreign Language – 2 and/or<br>Advanced Tech Ed – 2                         | Foreign Language I        | Foreign Language II<br>or → | Advanced Technology Education             | Advanced Technology Education  |

| <b>The Community College of Baltimore County<br/>Automotive Technology AAS Degree</b>   |               |
|---|---------------|
| <b>General Education Requirements:</b>  |               |
| Fundamentals of Speech Communication  | 3 credits     |
| College Composition I   | 1 credit      |
| Introduction to Computers   | 3 credits     |
| <b>General Education Electives:</b>   |               |
| Biological and Physical Sciences  | 3-4 credits   |
| Mathematics   | 3 credits     |
| Social and Behavioral Sciences  | 3 credits     |
| Arts & Humanities or Social & Behavioral Sciences   | 3 credits     |
| General Education Total   | 21-22 credits |
| <b>Program Requirements</b>   |               |
| Service Automotive Heating & Air Conditioning   | 3 credits     |
| Repairing automotive Brake Systems  | 4 credits     |
| Servicing Electrical and Electronic Systems   | 5 credits     |
| Servicing Automotive Engines and Related Systems  | 5 credits     |
| Repairing automotive Electrical Systems   | 3 credits     |
| Repairing Automotive Automatic Transmissions  | 4 credits     |
| Repairing automotive Manual Transmissions   | 4 credits     |
| Repairing Automotive Electronics  | 5 credits     |
| Repairing Automotive Suspension Systems   | 4 credits     |
| Repairing Automotive engines  | 5 credits     |
| Repairing Automotive Engine-Related Systems   | 4 credits     |
| <b>Total Credits Required for Degree</b>  | <b>67-68*</b> |
| <p><b>* Note</b> a new college orientation requirement, completion of the one-credit ACDV 101 course, Transitioning to College, goes into effect spring 2010. If you are a credit student who is new to the college in the spring 2010 semester, you are required to take ACDV 101 during your first semester at CCBC, thereby increasing the number of credits required to graduate by one credit from what is listed above.</p> |               |

**Maryland State Department of Education**  
**Program of Study**  
**Automotive Technology Course Descriptions**

**Program Description**

The Automotive Technician CTE Program of study is an instructional program that incorporates the Automotive Service Excellence (ASE) program certification standards and the National Automotive Technicians Education Foundation (NATEF) task lists. The program prepares students for further education and careers in the Transportation Equipment Pathway and automotive technology. The program consists of four courses that are divided into four groups: Suspension and Steering (A-4), Brakes (A-5), Electrical/Electronic Systems (A-6), and Engine Performance (A-8).

Students participating in the Auto Technician Program will understand and be able to:

1. Develop workplace (employability) skills by demonstrating mastery of required academic and performance skills;
2. Demonstrate the ability to perform all tasks in a safe and expedient manner;
3. Demonstrate the ability to identify appropriate industry procedure/reference/estimation/training materials (both computerized and hardbound) to locate appropriate instructions and perform according to the stated guidelines;
4. Perform all diagnostic and repair tasks in accordance with manufacturer's recommended procedures;
5. Develop thinking skills by analyzing, troubleshooting and solving automotive repair problems utilizing late model vehicles and state of the art tools and equipment (A-4, A-5, A-6, A-8);
6. Utilize computerized equipment and software to collect and analyze fault codes and automotive operating and digital sending devices to isolate problem sources and perform corrective repairs (A-4, A-5, A-6, A-8);
7. Use industry standard fault locator devices in the testing and analysis of on-board computer systems, digital circuitry and other digital sending devices;
8. Troubleshoot noncode generating repair problems utilizing state-of-the-art computer software and manuals to identify the sources of and symptoms of necessary repairs; and
9. Work in teams to analyze and solve challenging simulated and real world repair problems utilizing late model vehicles and state-of-the-art diagnostic tools and equipment. Under the supervision of ASE certified technicians, students troubleshoot, solve and repair complex problems as members of teams and individually.

**Secondary Courses**

**Suspension and Steering (A-4) (1 Credit)**

**Course Description:**

This course provides the student with the knowledge and skills necessary to pass the NATEF end-of-course assessment for Automobile Suspension and Steering and immediately enter a career in this area and/or attend post-secondary education and/or training. Students develop diagnostic, technical, problem-solving and academic skills through classroom instruction and hands-on maintenance applications. Through theory and real-world experiences, students master the concepts and the ability to research applicable vehicle and

service information, collect and analyze relevant data, troubleshoot, identify, formulate proposed solutions to problems and perform necessary automobile suspension and steering repair tasks. Students will use state-of-

the-art precision steering and alignment measurement tools and equipment to gather, analyze and make necessary repairs

Students will understand and be able to perform:

- Steering System Diagnosis and Repair
- Front Suspension Diagnosis and Repair
- Rear Suspension Diagnosis and Repair
- Related Suspension and Steering Service
- Wheel Alignment Diagnosis, Adjustment and Repair
- Wheel and Tire Diagnosis and Repair

### **Brakes (A-5) (1 Credit)**

#### **Course Description:**

This course provides the student with the knowledge and skills necessary to pass the NATEF end-of-course assessment for Automobile Brakes and immediately enter a career in this area and/or attend postsecondary education and/or training. Students develop diagnostic, technical problem-solving and academic skills through classroom instruction and hands-on maintenance applications. Through theory and real-world experiences, students master the concepts and the ability to research applicable vehicle and service information, collect and analyze relevant data, troubleshoot, identify, formulate proposed solutions to problems and perform necessary automobile brake diagnosis and repair tasks. Students will use state-of-the-art precision brake measurement tools and equipment to gather, analyze make necessary NATEF required brake repairs tasks.

Students will understand and be able to perform:

- Hydraulic System Diagnosis and Repair
- Drum Brake Diagnosis and Repair
- Disc Brake Diagnosis and Repair
- Power Assist Units Diagnosis and Repair
- Miscellaneous Diagnosis and Repair: Wheel Bearings
- Miscellaneous Diagnosis and Repair: Parking Brakes
- Miscellaneous Diagnosis and Repair: Electrical Diagnosis and Repair of Brake Light System
- Electronic Brake, Traction and Stability Control Systems Diagnosis and Repair

### **Electrical/Electronic Systems (A-6) (2 Credits)**

#### **Course Description:**

This course provides the student with the knowledge and skills necessary to pass the NATEF or AYES end-of-course assessment for Automobile Electrical/Electronic Systems and immediately enter a career in this area and/or attend postsecondary education and/or training. Students develop diagnostic, technical problem-solving and academic skills through classroom instruction and hands-on maintenance applications. Through theory and real-world experiences, students master the concepts and the ability to research applicable vehicle and service information, collect and analyze relevant data, troubleshoot, identify, formulate proposed solutions to problems and perform necessary automobile electrical and electronic systems repair tasks. Students will use state-of-the-art precision electronic measurement tools, fault code readers and equipment to gather, analyze make necessary NATEF required electrical and electronic system repairs.

Students will understand and be able to perform:

- General Electrical System Diagnosis
- Battery Diagnosis and Service
- Starting System Diagnosis and Repair
- Charging System Diagnosis and Repair
- Lighting System Diagnosis and Repair
- Gauge, Warning Devices and Driver Information Systems Diagnosis and Repair
- Horn Diagnosis and Repair
- Wiper/Washer Diagnosis and Repair
- Accessories Diagnosis and Repair

### **Engine Performance (A-8) (1 Credit)**

#### **Course Description:**

This course provides the student with the knowledge and skills necessary to pass the NATEF end-of-course assessment for Automobile Engine Performance and immediately enter a career in this area and/or attend postsecondary education and/or training. Students develop diagnostic, technical problem-solving and academic skills through classroom instruction and hands-on maintenance applications. Through theory and real-world experiences, students master the concepts and the ability to research applicable vehicle and service information, collect and analyze relevant data, troubleshoot, identify, formulate proposed solutions to problems and perform necessary automobile engine performance troubleshooting and repair tasks. Students will use state-of-the-art precision electronic engine performance measurement tools, fault code readers and equipment to gather, analyze make necessary NATEF required engine performance repairs.

Students will understand and be able to perform:

- Engine Related Service
- General Engine Diagnosis
- Computerized Engine Controls Diagnosis and Repair
- Ignition System Diagnosis and Repair
- Fuel Systems Diagnosis and Repair
- Air Induction System Diagnosis and Repair
- Exhaust System Diagnosis and Repair
- Emission Control System Diagnosis and Repair: Positive Crankcase Ventilation System
- Emission Control System Diagnosis and Repair: Exhaust Gas Recirculation System
- Emission Control System Diagnosis and Repair: Secondary Air Injection (AIR) and Catalytic Converter,
- Emission Control System Diagnosis and Repair: Evaporative Emission Controls

**Articulation Agreement Signature Page Between  
Maryland State Department of Education on  
Behalf of Local School Systems and  
The Community College of Baltimore County**

| <b>MSDE Automotive Technology Program</b> |                |
|---|----------------|
| <b>Course Title</b>                       | <b>Credits</b> |
| Suspension and Steering                   | 1              |
| Brakes                                    | 1              |
|   |                |

| <b>CCBC Program Title</b> |  |                       |
|---------------------------|--|-----------------------|
| <b>Course No.</b>         | <b>Course Title</b>                                | <b>Credit Awarded</b> |
| AUTO171                   | Repairing Automotive Steering & Suspension Systems | 4                     |
| AUTO126                   | Repairing Automotive Brake Systems                 | 4                     |
|                           |  |                       |

or

| <b>MSDE Automotive Technology Program</b> |                |
|---|----------------|
| <b>Course Title</b>                       | <b>Credits</b> |
| Electrical/Electronic Systems             | 2              |
| Engine Performance                        | 1              |
|   |                |

| <b>CCBC Program Title</b> |   |                       |
|---------------------------|---|-----------------------|
| <b>Course No.</b>         | <b>Course Title</b>                                   | <b>Credit Awarded</b> |
| AUTO131                   | Servicing Automotive Electrical & Electronics Systems | 5                     |
| AUTO141                   | Servicing Automotive Engines & Related Systems        | 5                     |
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