BRONX COMMUNITY COLLEGE
DIVISION OF ACADEMIC AFFAIRS

AUTOMOTIVE TECHNOLOGY PROGRAM
ASSESSMENT PLANNING TEMPLATE

May 15, 2009

Department/Program	Physics and Technology–Automotive Technology Program
Department Chairperson	Dr. Luis Montenegro
Program Coordinator/ Director	Mr. Clement Drummond
Academic Assessment/ Review Leader	Mr. Clement Drummond
Course	**ACS 24 Electrical Systems**

History

Our Automotive Technology Program was revised in 2006 to the National Automotive Technician Education Foundation (NATEF) standards. The BCC Curriculum Committee approved the revisions in 2007 and were implemented. Our Program was reviewed by NATEF in 2008, and we received accreditation in four areas: Brakes; Electrical and Electronics; Suspension and Steering; and Engine Performance.

In 2009 additional areas will be reviewed for accreditation: Automatic Transmissions and Transaxle; Engine Repair; Standard Transmission and Transaxle; Air Conditioning and Heating; and Compressed Natural Gas Maintenance.

1. What student learning outcomes will be assessed?

Identify the skills, knowledge, values, or attitudes expected of students.

The students will:

a. Learn the basic principles of electricity and circuits. Including an understanding of electrical terminology, circuit and component design and operation. Comprehend Ohm's law and its application in the design and operation of electrical circuits and components.

b. Demonstrate an understanding of the functions and operation of automotive electrical components and systems. Including the ability to identify and test electrical components and systems.

c. Diagnose problems using logic, symptom description and use of appropriate diagnostic gauges, meters, and test equipment.

d. Develop the necessary skills to be able to work in a team.

e. Use Mathematics/Statistics to solve problems.

f. Use reading, writing, listening and speaking skills to find, interpret and communicate information in various modes, statistical, symbolic and graphic.

g. Be able to identify, test, disassemble, and repair the primary automotive electrical systems (the starting system, batteries, charging systems and lighting system).

2. What program/course teaching goals do these outcomes fulfill?

ACS 24 Electrical Systems—This course begins with the basics of electrical theory and advances through the operation of all 12 Volt systems used in the modern automobile including: storage batteries, alternator/charging systems, starter circuitry, wiring harnesses, lighting, and body accessories. The course places an emphasis on the use of both DVOM technology and computer-based diagnostics.

3. Identify any of these outcomes that speak to the College's General Education goals and proficiencies and explain this relationship.

a. Communication—Learning the basic principles of electricity and circuitry through reading, writing, listening to find, interpret, and communicate information in various forms, statistical and symbolic.

b. Reasoning and Analysis—Demonstrate the ability to use abstract reasoning, including the ability to analyze, interpret, evaluate, and integrate information; apply the results, formulate and solve problems in the diagnosis and repair of automotive electrical system.

c. Mathematical Methods—Demonstrate the ability to use and apply mathematical formulas and measurements in regard to the operation and application to electrical systems.

d. Scientific Methods—Use of a method of inquiry based on the gathering of observable, measurable evidence in order to formulate a diagnosis of malfunctioning electrical systems and components.

e. Information Literacy—Use of technology to diagnose and repair automotive electrical systems and components.

4. What is the rationale for assessing them?

The Automotive Technology Program is accredited by the National Automotive Technician Education Foundation and requires that students be evaluated using hands-on performance standards developed by industry and employers.

5. ***What curriculum components–including those in recently implemented, new, or revised course–appear to most challenging to students?***

ACS 10 - The Introduction to Automotive Technology was a new course in 2007, students had difficulty completing their term assignments. The problem was that our expectation of completing an on-line program with multiple categories was overwhelming the students with homework.

Faculty evaluated the course goals and determined that the amount of work required in the course far exceeded what was needed to complete the program. Revisions were instituted to ensure that student progress met the new goals.

6. ***Are there issues related to student learning or performance that have been raised by accrediting or external valuators? What are these issues?***

No issues

7. ***What methods will be used to evaluate work?***

a. NATEF requires that the curriculum include a **performance-based standard for each task** that is recommended by industry/employers with an acceptable rating.

b. All tasks have been given a **priority rating**:

1. **Priority 1 (P-1) -- Ninety-five percent (95%) of the tasks require** a working knowledge of the most commonly executed operations in a shop/work environment.

   For example:

   a. Identify and interpret electrical/electronic system concern; determine necessary action.

   b. Diagnose electrical/electronic integrity of series, parallel and series-parallel circuits using principles of electricity (Ohm's Law).

   c. Repair wiring harness (including CAN/BUS systems).

2. **Priority 2 (P-2) -- Eighty percent (80%) of the tasks require** a working knowledge of less commonly executed operations in a shop/work environment.

   For example:

   a. Check electrical circuits with a test light; determine necessary action.

   b. Inspect and test starter relays and solenoids; determine necessary action.

   c. Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action.

3. **Priorities 3 (P-3) -- Fifty percent (50%) of the tasks require** a working knowledge of the least commonly executed operations in a shop/work environment.

   For example:

   a. Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action.

   b. Diagnose incorrect operation of cruise control systems; determine necessary action.

   c. Diagnose the cause of false, intermittent, or no operation of anti-theft systems.

8. What criteria or measurement standards will be used to evaluate various levels of performance in student work?

a. Student performance will be evaluated based upon the NATEF requirements of **P1, P2, and P3**. A rubric measurement will be used for **Performance Evaluation** to determine student achievement: seventy percent (70%) of the students who complete the course will achieve a passing grade of 70% or better.

   The ratings will be:

   3 Satisfactory
   2 Satisfactory with Deficiencies
   1 Unsatisfactory

b. Three exams comprising of 40 questions will be administered throughout the semester and will represent 30 percent of the student's grade.

9. How many students will be selected as the target population for assessment, and in which courses?

Two sections enrolling 56 students each semester for a total of 112 students for an academic year will be the target population. Enrollment is limited because of the number of computers available.

There are 189 students enrolled in the degree and certificate programs

10. Which faculty will be involved?

Mr. George Patchoros will be the instructor for the two sections.

11. What is the timeline for assessment implementation?

a. **Program Goals**

The Automotive Technology curriculum prepares the student for a career as an automotive technician. This curriculum develops understanding of operational principles, service sequences and diagnostic techniques for the automobile.

Upon completion of this curriculum, the graduate is prepared for entry-level positions in various areas of the automotive industry dealing with development, testing, diagnosis and service of mechanical, hydraulic, electrical and thermodynamic automotive systems.

Automotive Technology graduates are employed in a variety of automotive-oriented positions including test technicians, diagnostician, equipment sales and service, independent business administrator, dealership service manager, service writer, engine machinist and rebuilder, fuel injection, automatic transmission and engine management specialist, as well as general service technician.

b. Learning outcomes developed by March 2009.

c. Assessment instruments will be completed by May 2009.

d. Measurement criteria in rubrics and other tools completed by May 2009.

e. Collections of data conducted in December 2009 and May 2010.

f. Analysis of data will be assessed in January 2010 and June 2010.

g. Sharing findings with department faculty in January and August 2010.

h. Action plan based upon findings in September 2010.

i. Reporting assessment findings in September 2010.

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Course	**ACS 11 – Engine Repair**

1, ***What student learning outcomes will be assessed?***

Identify the skills, knowledge, values, or attitudes expected of students.

The students will:

a. Learn the identification and classification of engine types, engine measurements, performance characteristics and testing diagnostics--including an understanding of bore, stroke, displacement, compression ratio, efficiency, torque and horsepower.

b. Demonstrate disassembly and assembly procedures, inspection, cleaning measuring, fitting, and sealing of engines.

c. Diagnose problems using logic, symptom description, and use of appropriate diagnostic gauges, meters and testing equipment.

d. Develop the necessary skills to be able to work in a team.

e. Use Mathematics/Statistics to solve problem.

f. Use reading, writing, listening, and speaking skills to find, interpret, and communicate information in various modes, statistical, symbolic, and graphic.

2. What program/course teaching goals do these outcomes fulfill?

ACS 11 – is the study of the modern internal combustion gasoline engine including basic principles of design and operation. This course covers disassembly, inspection and precision measuring, and continues with reassembly including fitting and reconditioning parts. It also includes materials covering engine support systems including cooling, lubrication, and basic ignition system fundamentals and engine lubricants.

3. Identify any of these outcomes that speak to the College's General Education goals and proficiencies and explain this relationship.

a. Communication—Learning the basic principles of the internal combustion engine including design and operation through reading, writing, listening to find, interpret, and communicate information in various forms, statistical and symbolic.

b. Reasoning and Analysis—Demonstrate the ability to use abstract reasoning, including the ability to analyze, interpret, evaluate, and integrate information; apply the results, formulate and solve problems in the diagnosis and repair of the internal combustion engine.

c. Mathematical Methods—Demonstrate the ability to use and apply mathematical formulas and measurements in regard to the operation and application to engine repairs.

d. Scientific Methods—Use of a method of inquiry based on the gathering of observable, measurable evidence in order to formulate a diagnosis of malfunctioning internal combustion engine and sub-system components.

e. Information Literacy—Use of technology to diagnose and repair automotive of the internal combustion engine and components.

4. What is the rationale for assessing them?

The Automotive Technology Program is accredited by the National Automotive Technician Education Foundation and requires that students be evaluated using hands-on performance standards developed by industry and employers.

***5. What methods will be used to evaluate work*?**

a. NATEF requires that the curriculum include a **performance-based standard for each task** that is recommended by industry/employers with an acceptable rating.

b. All tasks have been given a **priority rating**:

1. Priority 1 (P-1) -- Ninety-five percent (95%) of the tasks require a working knowledge of the most commonly executed operations in a shop/work environment.

For example:

a. Inspect engine assembly for fuel, oil, coolant and other leaks; determine necessary action.

b. Perform cylinder compression tests; determine necessary action.

c. Establish camshaft timing and cam sensor indexing according to manufacturer's specifications and procedures.

2. Priority 2 (P-2) -- Eighty percent (80%) of the tasks require a working knowledge of less commonly executed operations in a shop/work environment.

For example:

a. Diagnose the cause of excessive oil consumption, unusual engine exhaust color, odor and sound; determine necessary action.

b. Remove cylinder head. Visually inspect for cracks. Check gasket surface for warpage and leakage; determine necessary action.

c. Disassemble engine block; clean and prepare components for inspection and reassembly.

3. Priorities 3 (P-3) -- Fifty percent (50%) of the tasks require a working knowledge of the least commonly executed operations in a shop/work environment.

For example:

a. Inspect camshaft bearing surface for wear, damage, out-of-round and alignment; determine necessary action.

b. Inspect or replace engine vibration damper (harmonic balancer).

c. Remove and replace piston pins according to manufacturer's specifications.

6. What criteria or measurement standards will be used to evaluate various levels of performance in student work?

a) Student performance will be evaluated based upon the NATEF requirements of **P1, P2, and P3**. A rubric measurement will be used for **Performance Evaluation** to determine student achievement: Seventy percent (70%) of the students who complete the course will achieve a passing grade of 70% or better.

The ratings will be:

3 Satisfactory
2 Satisfactory with Deficiencies
1 Unsatisfactory

b) Three exams comprising of 40 Automotive Service Excellence Certification type questions will be administered throughout the semester and will represent 30% of the student's grade.

7. ***How many students will be selected as the target population for assessment, and in which courses?***

Two sections enrolling 56 students each semester for a total of 112 students for an academic year will be the target population. Enrollment is limited to the laboratory equipment available.

There are 189 students enrolled in the degree and certificate programs

8. Which faculty will be involved?

Mr. Henry Cordero, Adjunct Instructor
Mr. Clement Drummond, Adjunct Instructor