

# AUTOMOBILE-MECHANICAL (404)

Information provided includes course descriptions by subject only. For complete 2024-2025 programs/academic plans, please refer to Academic Programs (<http://catalog.blackhawk.edu/academics/>).

## 404-100 Service Fundamentals 1

**Credits:** 0.5-1

In this course students will demonstrate basic hand tool applications, identify and practice service facility safety procedures, and identify careers and certifications in the automotive service sector.

**Aid Code:** 10 - undefined.

Complete Course Listing

## 404-102 Brake Service 1

**Credits:** 0.5-1

In this course students will define the purpose and function of hydraulic brake system components. Additionally, they will measure and inspect hydraulic brake system components to diagnose repairs. Students will practice safety protocols and general brake services and procedures.

**Aid Code:** 10 - undefined.

Complete Course Listing

## 404-106 Steering & Suspension 1

**Credits:** 0.5-1

In this course the student will define the functions and features of wheels and tires, including safety features, distortion, and center of gravity. They will perform tire maintenance and repair procedures.

**Aid Code:** 10 - undefined.

Complete Course Listing

## 404-610 Auto Care-4

**Credits:** .1

This course will teach auto care such as checking and filling fluids, tire inspection, and other basic troubleshooting skills.

**Aid Code:** 60 - undefined.

Complete Course Listing

## 404-611 Basic Auto Care-12

**Credits:** 1.2

Students will receive hands-on experience checking tires and brakes, changing engine oil, replacing lighting, and diagnosing drivability issues with techniques for minor repairs.

**Aid Code:** 60 - undefined.

Complete Course Listing

## 404-651 Service Fundamentals 2

**Credits:** 0.5-1

In this course students will demonstrate basic power tool applications, identify and practice equipment and lift safety procedures, and use comprehensive and manufacturer shop manuals to perform basic under-hood and under-car services.

**Aid Code:** 32 - undefined.

**Co-requisites:** 404 650

Complete Course Listing

## 404-652 Brake Service 1

**Credits:** 0.5-1

In this course students will define the purpose and function of hydraulic brake system components. Additionally, they will measure and inspect hydraulic brake system components to diagnose repairs. Students will practice safety protocols and general brake services and procedures.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-651)

Complete Course Listing

## 404-653 Brake Service 2

**Credits:** 0.5-1

In this course students will define the purpose and function of disc brake system components. Additionally, they will measure and inspect disc brake system components and perform repairs on those components.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-102 or 404-652)

Complete Course Listing

## 404-654 Brake Service 3

**Credits:** 0.5-1

In this course students will describe the purpose and function of drum brake system components. Additionally, they will measure and inspect drum brake system components and perform maintenance and repair on those components.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-103 or 404-653)

Complete Course Listing

## 404-655 Brake Service 4

**Credits:** 0.5-1

In this course students will define the purpose and function of wheel bearings and common electronic brake control systems. They will perform maintenance and repair tasks on wheel bearings and electronic brake control systems.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-104 or 404-654)

Complete Course Listing

#### **404-656 Steering & Suspension 1**

**Credits:** 0.5-1

In this course the student will define the functions and features of wheels and tires, including safety features, distortion, and center of gravity. They will perform tire maintenance and repair procedures.

**Aid Code:** 32 - undefined.

**Co-requisites:** 404-651

Complete Course Listing

#### **404-657 Steering & Suspension 2**

**Credits:** 0.5-1

In this course students will define the functions and features of steering systems. They will perform diagnosis, maintenance, and repair on various steering systems.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-106 or 404-656)

Complete Course Listing

#### **404-658 Steering & Suspension 3**

**Credits:** 0.5-1

In this course students will define the purpose and function of suspension systems and various components. Students will perform maintenance and repair on suspension systems.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-107 or 404-657)

Complete Course Listing

#### **404-659 Steering & Suspension 4**

**Credits:** 0.5-1

In this course students will define the purpose and function of wheel alignment and perform wheel alignment. Students will also identify wheel alignment problems given various diagnostic scenarios.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-108 or 404-658)

Complete Course Listing

#### **404-660 Auto Machine Shop**

**Credits:** 0.5-1

In this course students will practice and demonstrate essential machining skills used in automotive service facilities, including oxygen acetylene torch cutting and heating, repairing bolt threads, machining brake rotors on-and-off vehicle, and the use of a manual brake lathe.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-651)

Complete Course Listing

#### **404-661 Service Simulation**

**Credits:** 1-2

This course will allow students to visit dealerships, independent shops, and auto repair franchises to observe operations, procedures, and equipment of an operating shop or business.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-651)

Complete Course Listing

#### **404-662 Engine Repair 1**

**Credits:** 0.5-1

In this course students will define the purpose and function of components of automobile engines and remove, inspect, and reinstall engines. Additionally, students will diagnose and repair cylinder head and valve train problems.

**Aid Code:** 32 - undefined.

**Pre-requisites:** 404-651

Complete Course Listing

#### **404-663 Service Management**

**Credits:** 0.5-1

In this course students explore state and federal regulations concerning automotive servicing. Students will demonstrate their ability follow documentation procedures common to automotive service facilities.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-651)

Complete Course Listing

#### **404-664 Engine Repair 2**

**Credits:** 0.5-1

In this course students will define the purpose and function of components of automobile engine block assemblies. Students will practice diagnosing and repairing engine block assembly problems.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-110 or 404-662)

Complete Course Listing

#### **404-665 Engine Repair 3**

**Credits:** 0.5-1

In this course students will define the purpose and function of components of engine lubrication and cooling systems. Students will practice diagnosing and repairing lubrication and cooling system assembly problems.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-111 or 404-664)

Complete Course Listing

**404-666 Engine Repair 4****Credits:** 0.5-1

In this course students will define the purpose and function of components of engine ignition and fuel systems. Students will practice diagnosing engine condition, as well as inspecting and testing the impact of the ignition and fuel systems on engine performance.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-112 or 404-665)

Complete Course Listing

**404-667 Drive Train Service 1****Credits:** 0.5-1

In this course students will explore the principles and theory of the manual transmission transaxle system. Students will also define the function and purpose of components of the clutch system.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-651)

Complete Course Listing

**404-668 Drive Train Service 2****Credits:** 0.5-1

In this course students will practice diagnosis and maintenance of the manual transmission transaxle system.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-114 or 404-667)

Complete Course Listing

**404-669 Drive Train Service 3****Credits:** 0.5-1

In this course students will define the function and purpose of components of drive shafts, axles, final drives, 4-wheel drive systems, and all-wheel drive systems. Students will practice inspection, repair, and maintenance of these systems.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-115 or 404-668)

Complete Course Listing

**404-670 Heating & Air Conditioning Service 1****Credits:** 0.5-1

In this course students will explore the principles and basic functions of automobile heating and air conditioning systems.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-651)

Complete Course Listing

**404-671 Heating & Air Conditioning Service 2****Credits:** 0.5-1

In this course students will practice and demonstrate their ability to inspect, repair, and maintain heating and air conditioning systems.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-117 or 404-670)

Complete Course Listing

**404-672 Heating & Air Conditioning Service 3****Credits:** 0.5-1

In this course students will define the function and purpose of components of electronic climate control systems. Students will demonstrate their ability to inspect, repair, and maintain electronic climate control systems.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-118 or 404-671)

Complete Course Listing

**404-673 Heating & Air Conditioning Service 4****Credits:** 0.5-1

In this course students will explore the function and principles behind air conditioning system refrigerant recovery and charging.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-119 or 404-672)

Complete Course Listing

**404-674 ASE Certification Review****Credits:** 0.5-1

In this course students demonstrate readiness to complete ASE Certification through review of suspension and steering systems, electrical reading, and brake systems.

**Aid Code:** 32 - undefined.**Co-requisites:** 404-651

Complete Course Listing

**404-675 Electrical Service 1****Credits:** 0.5-1

In this course students will examine the use of a digital multimeter. Students will learn how to diagnose, test and analyze vehicle circuits.

**Aid Code:** 32 - undefined.**Co-requisites:** 404-651

Complete Course Listing

**404-676 Electrical Service 2****Credits:** 0.5-1

In this course students will examine electrical theory as well as the purpose and function of the following types of circuits; series, parallel and series-parallel. Students will calculate volts, and amps, using Ohm's Law of Resistance.

**Aid Code:** 32 - undefined.**Co-requisites:** 404-675

Complete Course Listing

#### **404-677 Electrical Service 3**

**Credits:** 0.5-1

In this course students will examine automotive wiring schematics and diagrams. Students will demonstrate the ability to navigate automotive service information systems and trace the flow of current from the battery through and from the load to ground.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-122 or 404-676)

Complete Course Listing

#### **404-678 Electrical Service 4**

**Credits:** 0.5-1

In this course students will examine the starting and charging system, voltage drops, and parasitic drains. Students will identify electrical problems using schematics and a digital multi-meter by defining the purpose and functionality of relays.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-123 or 404-677)

Complete Course Listing

#### **404-679 Electronic Engine Control Fundamentals 1**

**Credits:** 0.5-1

In this course students will practice and demonstrate the use of an automotive oscilloscope to view waveforms.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-121 or 404-678)

Complete Course Listing

#### **404-680 Electronic Engine Control Fundamentals 2**

**Credits:** 0.5-1

In this course students will define the purpose and function of scan tools, temperature sensors, and throttle position sensors. Students will demonstrate how to test temperature sensors and throttle position sensors using a scan tool and oscilloscope.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-125 or 404-679)

Complete Course Listing

#### **404-681 Electronic Engine Control Fundamentals 3**

**Credits:** 0.5-1

In this course students will identify the application of manifold absolute pressure and barometric pressure to mass air flow sensors. Students will define how automotive computers use mass air flow sensors. Students will practice and demonstrate their ability to test these sensors using a scan tool and oscilloscope.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-126 or 404-680)

Complete Course Listing

#### **404-682 Electronic Engine Control Fundamentals 4**

**Credits:** 0.5-1

In this course students will define the purpose and function of oxygen sensors. Students will practice and demonstrate how to test oxygen sensors using a scan tool and oscilloscope.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-127 or 404-681)

Complete Course Listing

#### **404-683 Electronic Engine Control Diagnosis 1**

**Credits:** 0.5-1

In this course students will demonstrate their ability to diagnose and analyze vehicle emission and drivability problems by using a scan tool in conjunction with diagnostic codes and automotive computer modes.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-128 or 404-351 or 404-682)

Complete Course Listing

#### **404-684 Electronic Engine Control Diagnosis 2**

**Credits:** 0.5-1

In this course students will demonstrate their ability to diagnose and analyze vehicle emission and drivability problems by using a scan tool in conjunction with diagnostic codes and automotive computer modes.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-129 or 404-683)

Complete Course Listing

#### **404-685 Emission Control Service and Certification**

**Credits:** 0.5-1

In this course students will demonstrate the use of diagnostic equipment to diagnose, adjust, replace, and repair emission-related components and parts.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-684)

Complete Course Listing

#### **404-686 Computerized Fuel Systems Service 1**

**Credits:** 0.5-1

In this course students will define the purpose and function of components of computerized fuel systems. Students will practice and demonstrate their ability to diagnose, test, and repair mechanical and electrical components of computerized fuel systems.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-130 or 404-357 or 404-684)

Complete Course Listing

**404-687 Computerized Fuel Systems Service 2****Credits:** 0.5-1

In this course students will define the purpose and function of various types of injectors. Students will explore the interaction between injector pulse width and the use of fuel trim as a diagnostic tool. Students will demonstrate their ability to test injector operation.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-131 or 404-686)

Complete Course Listing

**404-688 Engine Performance Diagnosis 1****Credits:** 0.5-1

In this course students will demonstrate their ability to diagnose and assess the operation of the ignition system.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-130 or 404-357 or 404-684)

Complete Course Listing

**404-689 Engine Performance Diagnosis 2****Credits:** 0.5-1

In this course students will define the purpose and function of the battery starting and charging system. Students will demonstrate their ability to test for parasitic drain and to test and diagnose the battery systems using an oscilloscope, scan tool, and multi-meter.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-133 or 404-688)

Complete Course Listing

**404-690 Engine Performance Diagnosis 3****Credits:** 0.5-1

In this course students will define the relationship of the engine control systems and emission monitors. Students will demonstrate their ability to repair drivability problems related to these systems, as well as how to diagnose them.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-134 or 404-689)

Complete Course Listing

**404-691 Engine Performance Diagnosis 4****Credits:** 0.5-1

In this course students will review and demonstrate comprehensive ability in the skills typically introduced during the first year of the program, including safety practices and the inspection and repair of brake systems, steering and suspension systems, engine systems, drive train systems, and heating and air conditioning systems.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-135 or 404-690)

Complete Course Listing

**404-692 Drive Train/Transaxle Service 1****Credits:** 0.5-1

In this course students will define the purpose and function of automatic transmissions and their components. Students will demonstrate their ability to inspect, diagnose, and maintain automatic transmissions.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-130 or 404-357 or 404-684)

Complete Course Listing

**404-693 Drive Train/Transaxle Service 2****Credits:** 0.5-1

In this course students will define the purpose and function of the torque converter clutch. Additionally, students will demonstrate the ability to diagnose automatic transmission problems using a scan tool, and to differentiate between engine and transmission drivability problems.

**Aid Code:** 32 - undefined.**Co-requisites:** (404-137 or 404-692)

Complete Course Listing

**404-694 Service Internship****Credits:** 1-2

This course provides students with the opportunity to demonstrate automotive inspection, repair, and maintenance skills in an operating service facility. Students will also complete a comprehensive report on their experiences after meeting the internship requirements.

**Aid Code:** 32 - undefined.**Co-requisites:** 404-651

Complete Course Listing

**404-695 Customer Service Fundamentals****Credits:** 1-2

In this course students will explore principles of successful customer service and relations. Students will demonstrate skills in relationship building and management through practical interviews and role-playing.

**Aid Code:** 32 - undefined.

Complete Course Listing

**404-696 Electric Vehicle Safety****Credits:** 0.5-1

In this course students will be introduced to electrical vehicle safety practices and protocols. This will include the basic operation of hybrid/ electric vehicle types, personal protective equipment (PPE), and how to identify high voltage systems and components and disable the high voltage system.

**Aid Code:** 32 - undefined.**Co-requisites:** 404-675

Complete Course Listing

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**404-697 Electric Vehicle Circuits & Systems**

**Credits:** 0.5-1

In this course students will gain knowledge in low voltage direct current/ circuits/systems, high voltage direct current circuits/systems and high voltage alternating current circuits.

**Aid Code:** 32 - undefined.

**Co-requisites:** (404-696)

Complete Course Listing