

DIESEL HEAVY EQUIPMENT II (412)

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/>).

412-101 Brake Service 1

Credits: 0.5-1

In this course students will explore the fundamental concepts of braking, including friction, heat, and pressure. Students will practice inspecting, testing, servicing, and repairing air brake circuits.

Aid Code: 10 - undefined.

Co-requisites: (412-100 or 412-450)

Complete Course Listing

412-107 Steering & Suspension 3

Credits: 0.5-1

In this course students will identify the purpose and function of heavy duty vehicle suspension systems and their components. Student will explore and identify air suspension, leaf spring suspension, aligning devices, equalizer systems, and all attaching hardware. Students will inspect, adjust, test and repair heavy duty vehicle suspension systems.

Aid Code: 10 - undefined.

Co-requisites: (412-106)

Complete Course Listing

412-108 Steering & Suspension 4

Credits: 0.5-1

In this course students will identify the purpose and function of steering systems and components. Students will practice diagnostic, inspection and repair procedures of heavy duty vehicle steering systems.

Aid Code: 10 - undefined.

Co-requisites: (412-107)

Complete Course Listing

412-109 Drivetrain 1

Credits: 0.5-1

In this course students will identify the purpose and function of heavy duty vehicle clutches and their components. Students will practice servicing, inspection, and replacement of several different types of heavy duty clutches.

Aid Code: 10 - undefined.

Co-requisites: (412-100)

Complete Course Listing

412-111 Drivetrain 3

Credits: 0.05-1

In this course students identify the purpose and function of automated transmissions within the heavy duty industry. Students will explore controls associated with various types of modern automated transmissions.

Aid Code: 10 - undefined.

Co-requisites: (412-110)

Complete Course Listing

412-411 Forklift Trainer - 6

Credits: .6

This course will teach adult learning styles, the OSHA regulations for Powered Industrial Trucks, sample training programs, sample forms as well as other effective trainer insight for experienced forklift operators.

Aid Code: 47 - undefined.

Complete Course Listing

412-412 Forklift Trainer - 8

Credits: .8

This 8-hour course will teach adult learning styles, the OSHA regulations for Powered Industrial trucks, sample training programs, sample forms as well as other effective trainer insight for experienced forklift operators.

Aid Code: 47 - undefined.

Complete Course Listing

412-413 Life Truck Train the Trainer

Credits: 0.05-4.8

Course will include the basics of the learning cycle along with adult learning methods for trainers. Participants will learn how to develop a training program for employees using OSHA standards, and specific to safe operation of lift trucks in manufacturing settings.

Aid Code: 47 - undefined.

Complete Course Listing

412-450 Introduction to Heavy Diesel

Credits: 0.5-1

In this course students will be introduced to the heavy duty diesel field. Students will explore the definition, purpose, and function of heavy duty vehicles. Students will identify career paths within the diesel technician field. Students will identify and practice shop safety procedures.

Aid Code: 32 - undefined.

Complete Course Listing

412-451 Brake Service 1

Credits: 0.05-1

In this course students will explore the fundamental concepts of braking, including friction, heat, and pressure. Students will practice inspecting, testing, servicing, and repairing air brake circuits.

Aid Code: 32 - undefined.

Co-requisites: (412-100 or 412-450)

Complete Course Listing

412-452 Brake Service 2

Credits: 1-2

In this course students will practice inspection, diagnosis, service, and repair of heavy duty vehicle s-cam and air disc brake systems.

Aid Code: 32 - undefined.

Co-requisites: 412-451

Complete Course Listing

412-453 Brake Service 3

Credits: 0.05-1

In this course students will identify the purpose and function of anti-lock braking systems, stability control, and collision avoidance systems. Students will identify, test, diagnose, and repair these systems to manufacturer specifications.

Aid Code: 32 - undefined.

Co-requisites: 412-452

Complete Course Listing

412-454 Steering & Suspension 1

Credits: 0.5-1

In this course students will define the purpose and function of wheel end components. Students will identify, inspect, test, adjust, and repair tires, wheels, rims and hubs to manufacturer specifications.

Aid Code: 32 - undefined.

Co-requisites: 412-450

Complete Course Listing

412-455 Steering & Suspension 2

Credits: 0.5-1

In this course students will explore front-end, alignment factors, and frames as they pertain to heavy diesel vehicles. Students will inspect, test, and repair front axles, frames, and attaching hardware. Students will identify electronic alignment and alignment factors that contribute to heavy duty vehicle instability.

Aid Code: 32 - undefined.

Co-requisites: 412-454

Complete Course Listing

412-456 Steering & Suspension 3

Credits: 0.5-1

In this course students will identify the purpose and function of heavy duty vehicle suspension systems and their components. Student will explore and identify air suspension, leaf spring suspension, aligning devices, equalizer systems, and all attaching hardware. Students will inspect, adjust, test and repair heavy duty vehicle suspension systems.

Aid Code: 32 - undefined.

Co-requisites: 412-455

Complete Course Listing

412-457 Steering & Suspension 4

Credits: 0.5-1

In this course students will identify the purpose and function of steering systems and components. Students will practice diagnostic, inspection and repair procedures of heavy duty vehicle steering systems.

Aid Code: 32 - undefined.

Co-requisites: 412-456

Complete Course Listing

412-458 Drivetrain 1

Credits: 0.5-1

In this course students will identify the purpose and function of heavy duty vehicle clutches and their components. Students will practice servicing, inspection, and replacement of several different types of heavy duty clutches.

Aid Code: 32 - undefined.

Co-requisites: 412-450

Complete Course Listing

412-459 Drivetrain 2

Credits: 0.5-1

In this course students will identify supporting principles and functions of manual transmission and gear concepts. Students will explore different gearing concepts, and how these concepts apply to standard transmissions used in the heavy diesel industry. Students will inspect, diagnose, service and repair standard transmission auxiliary assemblies to manufacturer specification.

Aid Code: 32 - undefined.

Co-requisites: 412-458

Complete Course Listing

412-460 Drivetrain 3

Credits: 0.5-1

In this course students identify the purpose and function of automated transmissions within the heavy duty industry. Students will explore controls associated with various types of modern automated transmissions.

Aid Code: 32 - undefined.

Co-requisites: 412-459

Complete Course Listing

412-461 Drivetrain 4**Credits:** 0.5-1

In this course students will identify the purpose and function of drive shafts and driven axles. Students will practice inspection, service, and repair of diesel and heavy duty vehicle drive shafts and drive axles.

Aid Code: 32 - undefined.**Co-requisites:** 412-460

Complete Course Listing

412-462 Electrical Fundamentals 1**Credits:** 0.5-1

In this course students will explore applications of fundamental principles and theories of electricity within the heavy duty vehicle industry.

Aid Code: 32 - undefined.**Co-requisites:** 412-450

Complete Course Listing

412-463 Electrical Fundamentals 2**Credits:** 0.5-1

In this course students identify the purpose and function of electrical circuits, circuit control devices, and electrical instrumentation. Students will practice testing individual and system circuits using a multimeter.

Aid Code: 32 - undefined.**Co-requisites:** 412-462

Complete Course Listing

412-464 Electrical Fundamentals 3**Credits:** 0.5-1

In this course students will identify the purpose and function of commercial vehicle batteries, as well as advanced battery technology and placement. Students will inspect, test, charge, and replace heavy duty commercial batteries to manufacturer specifications.

Aid Code: 32 - undefined.**Co-requisites:** 412-463

Complete Course Listing

412-465 Electrical Fundamentals 4**Credits:** 0.5-1

In this course students will identify the purpose and function of heavy duty vehicle starting and charging systems and their components. Students will practice testing, repairing, and replacing heavy duty vehicle starters, alternators and other electrical system components.

Aid Code: 32 - undefined.**Co-requisites:** 412-464

Complete Course Listing

412-466 Electrical Troubleshooting 1**Credits:** 0.5-1

In this course, students will explore heavy duty vehicle electrical wiring. Students will practice reading and interpreting electrical wiring schematics.

Aid Code: 32 - undefined.**Co-requisites:** 412-465

Complete Course Listing

412-467 Electrical Troubleshooting 2**Credits:** 0.5-1

In this course students practice inspecting, testing and repairing electrical lighting circuits and instrumentation on vehicles.

Aid Code: 32 - undefined.**Co-requisites:** 412-466

Complete Course Listing

412-468 Electrical Troubleshooting 3**Credits:** 0.5-1

In this course students will explore heavy duty vehicle electrical signal processing. Students will identify the purpose and function of sensors and sensor information, as well as control module processing of related information. Students will practice the use of electrical signal testing equipment.

Aid Code: 32 - undefined.**Co-requisites:** 412-467

Complete Course Listing

412-469 Electrical Troubleshooting 4**Credits:** 0.5-1

In this course students will identify the purpose and function of on-board vehicle diagnostic systems. Students will inspect, test diagnose, and repair multiple different systems to manufacturer specifications using information from control modules.

Aid Code: 32 - undefined.**Co-requisites:** 412-468

Complete Course Listing

412-470 Diesel HVAC 1**Credits:** 0.5-1

In this course students will explore basic principles of diesel vehicle heating and air conditioning, as well as heating and air conditioning controls and operation.

Aid Code: 32 - undefined.**Co-requisites:** 412-450

Complete Course Listing

412-471 Diesel HVAC 2

Credits: 0.5-1

In this course students practice inspecting, diagnosing, and servicing diesel vehicle heating and air conditioning systems per manufacturer, EPA, and MVAC standards. This course will prepare students to become MVAC 609 certified.

Aid Code: 32 - undefined.

Co-requisites: 412-470

Complete Course Listing

412-472 Diesel HVAC 3

Credits: 0.5-1

In this course students identify the purpose and function of trailer refrigeration systems and their components.

Aid Code: 32 - undefined.

Co-requisites: 412-471

Complete Course Listing

412-473 Advanced Safety Procedures

Credits: 0.5-1

In this course students will identify and perform safe work practices in accordance with OSHA requirements. These practices will be applicable to diesel shops, as well as other environments in the diesel industry.

Aid Code: 32 - undefined.

Co-requisites: 412-450

Complete Course Listing

412-474 Engine Fundamentals 1

Credits: 0.5-1

In this course students will describe the development of diesel technology. Students will identify the various applications of diesel engines and identify how major technologies and strategies are used to reduce diesel engine emissions.

Aid Code: 32 - undefined.

Co-requisites: 412-473

Complete Course Listing

412-475 Engine Fundamentals 2

Credits: 0.5-1

In this course students will identify and describe the categories of noxious emissions from diesel engines, as well as the operations that produce them. Students will identify emission standards for diesel vehicles and the various monitoring and control systems used to manage emissions.

Aid Code: 32 - undefined.

Co-requisites: 412-474

Complete Course Listing

412-476 Engine Fundamentals 3

Credits: 0.5-1

In this course students will explore and identify characteristics and components of diesel compression ignition systems. Students will practice inspecting and repairing these systems.

Aid Code: 32 - undefined.

Co-requisites: 412-475

Complete Course Listing

412-477 Engine Fundamentals 4

Credits: 0.5-1

In this course students will explore and identify characteristics and components of diesel compression ignition systems. Students will identify and explain the effects of fuel system properties on diesel combustion as well as practice inspecting and repairing these systems.

Aid Code: 32 - undefined.

Co-requisites: 412-476

Complete Course Listing

412-478 Engine Service Repair 1

Credits: 0.5-1

In this course students will practice diesel engine service and troubleshooting, including cleaning, inspecting, and determining corrective action for a variety of components. Students will explore the repairing of diesel engine cylinder block and crankshaft assemblies.

Aid Code: 32 - undefined.

Co-requisites: 412-477

Complete Course Listing

412-479 Engine Service Repair 2

Credits: 0.5-1

In this course students will identify the purpose and function of cylinder heads and valve train mechanisms. Students will practice inspecting, troubleshooting, diagnosing, and repairing diesel engine cylinder heads.

Aid Code: 32 - undefined.

Co-requisites: 412-478

Complete Course Listing

412-480 Engine Service Repair 3

Credits: 0.5-1

In this course students will identify characteristics and components of diesel lubrication and cooling systems. Students will practice inspecting and repairing these systems.

Aid Code: 32 - undefined.

Co-requisites: 412-479

Complete Course Listing

412-481 Engine Service Repair 4**Credits:** 0.5-1

In this course students will identify the purpose and function of air intake and crankcase ventilation systems and their components. Students will practice performing inspections, diagnostic, maintenance procedures for these systems.

Aid Code: 32 - undefined.**Co-requisites:** (412-480)

Complete Course Listing

412-482 Engine Service Repair 5**Credits:** 0.5-1

In this course students will identify the purpose and function of turbochargers and their components. Students will practice inspection, testing, and diagnostic procedures for fixed and variable turbocharger systems.

Aid Code: 32 - undefined.**Co-requisites:** 412-481

Complete Course Listing

412-483 Engine Service Repair 6**Credits:** 0.05-1

In this course students will identify the purpose and function of diesel engine exhaust gas re-circulation and after-treatment systems and their components. Students will practice performing inspection and diagnostic procedures on these systems.

Aid Code: 32 - undefined.**Co-requisites:** 412-482

Complete Course Listing

412-484 Hydraulics 1**Credits:** 0.5-1

In the course students will identify the purpose and function of hydraulic systems, as well as everyday applications of those systems. Students will read and interpret hydraulic system diagrams and schematics and students will perform temperature, pressure, flow, and cycle time tests on hydraulic systems.

Aid Code: 32 - undefined.**Co-requisites:** (412-450)

Complete Course Listing

412-485 Hydraulics 2**Credits:** 0.05-1

In this course students will practice the inspection, tear down, and reassembly of major hydraulic components. Students will identify the purpose and function of hydraulic braking systems used in on and off highway equipment.

Aid Code: 32 - undefined.**Co-requisites:** 412-484

Complete Course Listing

412-486 Hydraulics 3**Credits:** 0.5-1

In this course students will identify the purpose and function of automatic transmission systems and their components. Students will identify the purpose and function of torque converters and the planetary gear concept.

Aid Code: 32 - undefined.**Co-requisites:** (412-485)

Complete Course Listing

412-487 Hydraulics 4**Credits:** 0.05-1

In this course students will identify the purpose and function of hydraulic and electronic controlled automatic transmission systems and their components. Students will practice maintenance and servicing the automatic transmission system.

Aid Code: 32 - undefined.**Co-requisites:** 412-486

Complete Course Listing

412-488 Diesel Fuel Systems 1**Credits:** 0.5-1

In this course students will identify and describe the properties and characteristics of diesel fuel, fuel additives, and fuel systems. Students will practice inspection and servicing problems associated with low-pressure fuel systems.

Aid Code: 32 - undefined.**Co-requisites:** (412-450)

Complete Course Listing

412-489 Diesel Fuel Systems 2**Credits:** 0.05-1

In this course students will identify the purpose and function of high-pressure fuel injection systems in diesel applications. Students will practice inspection and diagnostic procedures for these mechanical fuel injection systems.

Aid Code: 32 - undefined.**Co-requisites:** 412-488

Complete Course Listing

412-490 Diesel Fuel Systems 3**Credits:** 0.05-1

In this course students will identify the purpose and function of various electronic fuel injection systems. Students will practice maintenance and repair of various electronic fuel injection systems.

Aid Code: 32 - undefined.**Co-requisites:** 412-489

Complete Course Listing

412-491 Diesel Fuel Systems 4

Credits: 0.05-1

In this course students will identify the function and construction of common rail fuel systems. Students will practice maintenance, reconditioning, and repairs of common rail fuel systems.

Aid Code: 32 - undefined.

Co-requisites: 412-490

Complete Course Listing

412-492 Inspection & Maintenance Procedures 1

Credits: 0.5-1

In this course students will define preventative maintenance practices. Students will identify regulations related to the maintenance and operation of commercial vehicles, and identify best practices for establishing preventative maintenance and inspection schedules.

Aid Code: 32 - undefined.

Co-requisites: 412-453 and 412-457 and 412-461 and 412-465 and 412-469 and 412-472 and 412-483 and 412-477 and 412-487 and 412-497 and 412-450 and 412-473

Complete Course Listing

412-493 Inspection & Maintenance Procedures 2

Credits: 0.05-1

In this course students will define the importance of preventative maintenance and practice following a preventative maintenance schedule, including reviewing inspection requirements and performing inspections and maintenance.

Aid Code: 32 - undefined.

Co-requisites: 412-492

Complete Course Listing

412-494 Inspection & Maintenance Procedures 3

Credits: 0.05-1

In this course students will identify the requirements of preventative maintenance and inspection plans and programs. Students will practice preventative maintenance record keeping. Students will identify the qualifications for vehicle inspectors and brake inspectors.

Aid Code: 32 - undefined.

Co-requisites: 412-493

Complete Course Listing

412-495 Inspection & Maintenance Procedures 4

Credits: 0.05-1

In this course students will practice activities that make up the preventative maintenance inspection process, such as locating information about recalls, distinguishing between shop and vehicle rules, and identifying specialty tools.

Aid Code: 32 - undefined.

Co-requisites: 412-494

Complete Course Listing

412-496 ASE Certification Review

Credits: 0.5-1

In this course students will apply standards practiced throughout the program in preparation for ASE certification and the diesel technician career field.

Aid Code: 32 - undefined.

Co-requisites: 412-495

Complete Course Listing

412-497 Alternate Fuels

Credits: 0.5-1

In this course students will discover alternate fuel technology and systems within the Medium/Heavy duty vehicle industry. This includes compressed natural gas and hydrogen fuel cell technologies.

Aid Code: 32 - undefined.

Co-requisites: 412-491

Complete Course Listing