


Diesel - Clean Diesel Technology

| American River College


American River College offers a wide variety of programs to appeal to a diverse group of students. Our Automotive Technology, Automotive Collision Technology and Diesel/Clean Diesel Technology programs are a combination of classroom and hands-on shop experiences that prepare students for careers in all phases of the transportation industry. Students are trained in the use of workshop manuals in traditional and computerized formats, hand-held meters and scanners and special shop tools including power and hand tools.


</academics/arc-program-road-maps>

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Associate Degree

A.S. in Diesel Technology

This degree provides training in diesel technology. Topics include an introduction to diesel technology, diesel engine repair, basic hydraulic principles of diesel technology, diesel brake systems, and diesel power trains.

Degree Requirements

COURSE CODE	COURSE TITLE	UNITS
DCDT 101	Diesel Preventive Maintenance	4
DCDT 110	Diesel Engine Repair	4
DCDT 120	Basic Hydraulic Principles of Diesel Technology	4
DCDT 130	Diesel Brake Systems	4
DCDT 140	Diesel Electrical Systems	4
DCDT 150	Diesel Power Trains	4
DCDT 162	Clean Diesel Software Support	4
Total Units:		28

The Diesel Technology Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- identify and properly utilize shop equipment and chemicals used in the diesel repair environment including hazardous waste disposal.
- apply proper techniques for complete engine removal, disassembly, cleaning, and reassembly of diesel engine.
- identify and explain brake system components, as well as application of proper technique for removal and repair of diesel brake system components.

- select and use proper test equipment to evaluate electrical systems, including voltmeters, ammeters, and ohmmeters.
- identify and explain diesel power train components and their functions to assist in diagnosis of drive train failure.

Career Information

This degree prepares the students as diesel technicians in the following areas of specialty: brakes, engine repair, hydraulics, and electrical.

Certificates of Achievement

Clean Diesel Hybrid Technology Certificate

This program covers hybrid-diesel components. Topics include heavy duty hybrid-diesel component application, diesel-hybrid motor generators, clean diesel software, and industrial software and systems.

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
DCDT 109	Hybrid Diesel Component Application	4
DCDT 113	Diesel Hybrid Motor Generators	4
DCDT 162	Clean Diesel Software Support	4
DCDT 163	Industrial Software and Systems	4
Total Units:		16

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- apply basic principles of hybrid diesel component application to proper troubleshooting procedures.
- explain electronic control in diesel hybrid vehicles.
- apply procedural information, illustrations, diagnostic information, and wiring diagrams to Cummins INSITE and Eaton diesel systems.
- locate, download, and apply retrieved data to diesel tractor conditions.

Gainful Employment

The US Department of Education requires colleges to disclose a variety of information for any program that is eligible for financial aid that "prepares students for gainful employment in a recognized occupation." The following link provides Gainful Employment Disclosure information for this certificate program:

[Gainful Employment Information for Clean Diesel Hybrid Technology Certificate of Achievement \(https://web.losrios.edu/gainful-emp-info/arc/41479/41479.htm\)](https://web.losrios.edu/gainful-emp-info/arc/41479/41479.htm)

Career Information

Various entry-level positions exist in the hybrid diesel repair industry, such as entry-level technician and hybrid service advisor.

Clean Diesel Management Systems Certificate

This program covers hybrid diesel technology. Topics include hybrid diesel power trains, hybrid diesel high voltage systems, clean diesel software support, and industrial software systems.

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
DCDT 107	Hybrid Diesel Power Trains	4
DCDT 108	Hybrid Diesel High Voltage Systems	4
DCDT 162	Clean Diesel Software Support	4
DCDT 163	Industrial Software and Systems	4
Total Units:		16

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- describe and explain power flow of hybrid diesel power trains.
- diagnose and repair high voltage cables, connectors, and components.
- locate, download, and apply retrieved information to diesel tractor conditions.
- communicate technical information about Cummins INSITE and Eaton diesel systems.

Gainful Employment

The US Department of Education requires colleges to disclose a variety of information for any program that is eligible for financial aid that "prepares students for gainful employment in a recognized occupation." The following link provides Gainful Employment Disclosure information for this certificate program:

[Gainful Employment Information for Clean Diesel Management Systems Certificate of Achievement \(https://web.losrios.edu/gainful-emp-info/arc/48217/48217.htm\)](https://web.losrios.edu/gainful-emp-info/arc/48217/48217.htm)

Career Information

Various entry-level positions exist in the hybrid diesel repair industry, such as entry-level technician and hybrid diagnostic technician.

Clean Diesel Technology Certificate

This program covers the diesel engine systems. Topics include biodiesel fuel and fuel systems, clean diesel technology, and clean diesel software support.

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
DCDT 102	Biodiesel Fuel and Fuel Systems	4
DCDT 103	Clean Diesel Systems	4
DCDT 104	Clean Diesel Rebuild, Retrofit, Repower, Retire	4
DCDT 110	Diesel Engine Repair	4
DCDT 112	Clean Diesel Retrofit	4
DCDT 162	Clean Diesel Software Support	4
Total Units:		24

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- access requirements for converting fossil fuel to biodiesel vehicles.

- apply basic principles to the modern diesel engine.
- apply technical information for repowering, rebuilding, and replacing diesel engine components.
- locate, download, and print information specific to diesel tractor manufacturers.
- apply manufacturer specifications for diesel engine retrofit.

Gainful Employment

The US Department of Education requires colleges to disclose a variety of information for any program that is eligible for financial aid that "prepares students for gainful employment in a recognized occupation." The following link provides Gainful Employment Disclosure information for this certificate program:

[Gainful Employment Information for Clean Diesel Technology Certificate of Achievement \(https://web.losrios.edu/gainful-emp-info/arc/37190/37190.htm\)](https://web.losrios.edu/gainful-emp-info/arc/37190/37190.htm)

Career Information

Various entry level positions exist in the diesel repair industry, such as entry level technician, hydraulic technician, and heavy equipment service advisor.

Diesel Engine Technology Certificate

This certificate is designed for students seeking employment in the diesel industry specializing in diesel engine repair.

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
DCDT 100	Diesel Technology Basics	4
DCDT 101	Diesel Preventive Maintenance	4
DCDT 110	Diesel Engine Repair	4
DCDT 111	Clean Natural Gas Engine Repair	4
DCDT 162	Clean Diesel Software Support	4
Total Units:		20

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- comply with safety and environmental regulations and standards required in the diesel repair environment.
- explain and identify natural gas diesel engines, including the proper cleaning, assembly and disassembly.
- demonstrate correct welding techniques for diesel application.
- utilize safety precautions that apply to diagnose and repair electrical/electronic components.
- locate, download, and print information specific to diesel tractor manufacturers and apply it to the diesel tractor conditions.

Career Information

The diesel industry is growing and is in need of highly trained/skilled technicians that can step into the workforce.

Diesel Technology Certificate

This certificate provides training in diesel technology. Topics include diesel brakes, hydraulics, electrical systems, and power trains.

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
DCDT 101	Diesel Preventive Maintenance	4
DCDT 110	Diesel Engine Repair	4
DCDT 120	Basic Hydraulic Principles of Diesel Technology	4
DCDT 130	Diesel Brake Systems	4
DCDT 140	Diesel Electrical Systems	4
DCDT 150	Diesel Power Trains	4
Total Units:		24

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- apply established procedures in the diesel repair industry.
- inspect and maintain various diesel engine systems.
- diagnose and repair diesel engine systems.

Gainful Employment

The US Department of Education requires colleges to disclose a variety of information for any program that is eligible for financial aid that "prepares students for gainful employment in a recognized occupation." The following link provides Gainful Employment Disclosure information for this certificate program:

[Gainful Employment Information for Diesel Technology Certificate of Achievement \(https://web.losrios.edu/gainful-emp-info/arc/30321/30321.htm\)](https://web.losrios.edu/gainful-emp-info/arc/30321/30321.htm)

Career Information

Various entry level positions exist in the diesel repair industry, such as entry level technician.

Light Duty Diesel Truck Certificate

This certificate prepares students for entry-level positions in the diesel technology industry. Topics include theory and operation of light duty diesel engines, computer controlled injection, and emission control systems.

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
DCDT 162	Clean Diesel Software Support	4
DCDT 163	Industrial Software and Systems	4
DCDT 200	Light Duty Diesel/Green Diesel Technology	4
DCDT 201	Advanced Light Duty Diesel/Green Diesel Technology	4
DCDT 280	Professionalism in the Industry	3
DCDT 281	Diesel Shop Operations	4
Total Units:		23

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- describe the basic operations of diesel fueled vehicles.
- perform basic diesel engine turbo charger diagnostic procedures.
- test diesel engine emissions and emission control systems.
- apply procedural information, illustrations, diagnostic information, and wiring diagrams to diesel tractors.
- analyze and evaluate the advantages and disadvantages of working in dealerships, independent shops, and fleet shops.

Career Information

Entry level positions in light duty diesel technology, agriculture, and construction industry. Additional career opportunities are likely as the light duty diesel industry continues to grow.

Preventive Maintenance Certificate

This certificate prepares students for entry-level positions in the diesel technology industry. The topics include safety and environmental regulations and standards, as well as the ability to identify various diesel engine applications.

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
DCDT 100	Diesel Technology Basics	4
DCDT 101	Diesel Preventive Maintenance	4
DCDT 110	Diesel Engine Repair	4
Total Units:		12

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- comply with safety and environmental regulations and standards
- explain the operation of diesel engine components and systems
- identify various diesel engine applications
- demonstrate complete engine reassembly
- apply basic state and federal regulations including Occupational Safety and Health Association (OSHA) and the Environmental Protection Agency (EPA)
- apply basic principles of preventive maintenance to diesel repair

Career Information

Entry level positions in the diesel repair industry.

Diesel/Clean Diesel Technology (DCDT)

DCDT 100 Diesel Technology Basics

Units:	4
Hours:	72 hours LEC
Prerequisite:	None.

This course introduces diesel technology. Topics include shop safety, hazardous waste handling and disposal, and engine components and their function.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- comply with safety and environmental regulations and standards required in the diesel repair environment.
- explain the operation of diesel engine components and systems.
- explain the principles of interpersonal skills as required in the workplace.
- utilize technician reference manuals.

DCDT 101 Diesel Preventive Maintenance

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course introduces the field of clean diesel technology and preventative maintenance. It covers proper safety and hazardous waste training, use of basic hand and power tools, and the basic workings of the diesel engine.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- identify proper use of hand and power tools used in diesel repair.
- utilize correct safety procedures for both hand and power tools used in diesel repair facilities.
- demonstrate basic functions of power tools in the shop.
- identify and properly utilize shop equipment and chemicals used in the diesel repair environment.
- demonstrate proper use of hydraulic and mechanical jacks and hoists.
- apply the basic state and federal regulations including Occupational Safety and Health Association (OSHA) and the Environmental Protection Agency (EPA).
- apply basic principles of preventive maintenance to diesel repair.

DCDT 102 Biodiesel Fuel and Fuel Systems

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers the chemistry, production, and impact of biodiesel technology. It also covers how to convert vehicle fuel systems to biodiesel and how this process affects warranties.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- list the requirements for converting fossil fuel vehicles to biodiesel vehicles.
- describe the process for making biodiesel.
- compare fossil fuel to straight vegetable oil, waste vegetable oil, and biodiesel.

DCDT 103 Clean Diesel Systems

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course provides a complete overview of the clean diesel engine system. Topics include fuel injection systems, emission regulations, and diesel emission control systems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- identify basic principles of the modern diesel engine.
- explain basic diesel engine fundamentals.
- identify diesel fuel injection systems.
- perform visual inspection of diesel engines.

DCDT 104 Clean Diesel Rebuild, Retrofit, Repower, Retire

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers clean diesel rebuilding, repowering, retrofitting, or retiring of equipment decisions. Topics include rebuilding, replacement, and retirement of diesel systems and components.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- decide whether to rebuild or replace.
- repair engine components.
- replace engine components.
- retire engine components.

DCDT 107 Hybrid Diesel Power Trains

Units:	4
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Hours:

54 hours LEC; 54 hours LAB

Prerequisite:

None.

This course covers diesel hybrid power trains found in current hybrid technology. Topics include basic diesel hybrid power trains, hybrid power modes, and power electronic carriers.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- apply high voltage safety procedures to diagnosis and repair of diesel hybrid vehicles
- explain the power flow found in diesel hybrid powered vehicles
- perform high voltage service shutdown procedures according to manufacturer manuals
- inspect and diagnose diesel hybrid power trains

DCDT 108 Hybrid Diesel High Voltage Systems

Units:

4

Hours:

54 hours LEC; 54 hours LAB

Prerequisite:

None.

This course covers high voltage power systems on diesel hybrid powered vehicles. Topics include high voltage main component identification and inspection, inspection of high voltage cables, testing, re-use, and end-of-service decisions.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- diagnose and repair diesel hybrid vehicles.
- explain high voltage flow of diesel hybrid powered vehicles.
- use electrical diagnostic tools to isolate malfunctions.
- diagnose, repair, and replace high voltage cables, connectors, and components.

DCDT 109 Hybrid Diesel Component Application

Units:

4

Hours:

54 hours LEC; 54 hours LAB

Prerequisite:

None.

This course covers testing and replacement of diesel hybrid components. Topics include electronic shifting theory and diesel hybrid component application.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the application and proper troubleshooting of diesel hybrid mounted components
- explain hybrid theory power up found in the Eaton system
- diagnose and repair or replace multiple relays, Push Button Controller, Hybrid Control module, and Transmission Electronic Control Unit

DCDT 110 Diesel Engine Repair

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers basic engine principles for diesel engine repair. It covers disassembly and reassembly of diesel engine systems, including cleaning and safe removal of engines, fuel injection systems, valve trains, and engine heads.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain diesel engine theory and repair.
- identify various diesel engine applications.
- apply proper techniques for cleaning and removal of diesel engines.
- define engine performance terms.
- describe air intake and exhaust system, lubrication systems, cooling systems, fuel systems, and governors.
- demonstrate complete engine reassembly.

DCDT 111 Clean Natural Gas Engine Repair

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course introduces clean natural gas engine repair. Topics include engine application and principles of engine operation, disassembly and reassembly of engine components and systems, and various engine systems as they relate to clean natural gas engines.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain clean natural gas diesel engine theory
- identify various clean natural gas diesel engine applications
- apply proper techniques for cleaning and removal of clean natural gas diesel engines

DCDT 112 Clean Diesel Retrofit

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers diesel engine retrofit needs for older diesel engines. Topics include troubleshooting, fault codes, welding, and diesel particulate filter systems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- install selective catalytic reduction filters as part of retrofitting.
- identify diesel particulate filters in need of replacement or retrofit.
- describe current retrofit technologies in the diesel industry.
- demonstrate correct welding techniques for diesel application.

DCCDT 113 Diesel Hybrid Motor Generators

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers diesel hybrid motor/generator found in current hybrid technologies. Topics include basic diesel hybrid motor/generator, hybrid power modes, and power electronic components.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- utilize safety precautions that apply to diagnose and repair electrical/electronic components.
- explain electronic control of multiple systems found in current diesel motor/generator.
- use electronic tools found in current diesel industry and utilize flowcharts to locate the malfunctions.
- diagnose and repair or replace multiple sensors and high voltage wiring harnesses found in full authority systems.

DCCDT 120 Basic Hydraulic Principles of Diesel Technology

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course introduces basic hydraulic principles and functions of the diesel engine. Topics include hydraulic fundamentals and principles, functions of hydraulic fluids, directional and flow control valves, welding, and machine hydraulic overview.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- use and apply proper safety procedures for basic hydraulic systems, including proper lifting and blocking procedures.
- demonstrate the proper use of both power and hand tools used in the diesel repair environment.
- explain the function of the basic hydraulic system.
- explain the operation of the components of the basic hydraulic system.
- identify hydraulic symbols.
- use precise measuring tools for hydraulic repair.

- explain the operation of hydraulic cylinders.
- demonstrate correct welding techniques for diesel application.

DCDT 130 Diesel Brake Systems

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers the operation of diesel brake systems and components. Topics include band, shoe, caliper, and full disc brakes.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the assembly of various brake systems and components.
- utilize the proper safety procedures for repair and replacement of diesel brake systems.
- apply proper techniques for removal and repair of diesel brake system components.
- explain the purpose of each braking component.
- demonstrate the proper use of diesel brake system repair tools.

DCDT 140 Diesel Electrical Systems

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers the operation of diesel electrical systems. Topics include sensors used in emission control, electrical circuits, test instruments, charging systems, and electrical starting systems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- select the proper test equipment to evaluate electrical systems.
- describe the function and use of new sensor technology for emissions control.
- describe the functions of various electrical system components.
- explain the differences between voltage and current.
- demonstrate the proper use of voltmeter, ammeter, and ohmmeter.
- read basic wiring diagrams.

DCDT 142 Diesel Emission Control Systems

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers the emission control system of the diesel engine. Topics include performance maintenance and emissions control within emission limits.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- identify potential and known health effects of diesel engine emissions.
- diagnose and correct causes of emission system control failure.
- perform visual inspection of emission control systems failure.
- inspect and repair emission system control failure.

DCDT 150 Diesel Power Trains

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers the diesel power train. Topics include inspection and adjustment of clutch linkage, flywheel, and replacement of clutch brakes.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- identify power train components and their functions.
- diagnose causes of drive train failure.
- perform visual drive train inspection.
- diagnose clutch problems.
- inspect and repair hydraulic clutch slave and master cylinders.
- inspect release fork, fork shaft, and bushings.

DCDT 162 Clean Diesel Software Support

Units:	4
Hours:	72 hours LEC
Prerequisite:	None.

This course covers the skills needed to adequately retrieve and apply system information using Internet-based technical manuals specifically geared toward diesel tractor emission control systems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- locate, download, and print information specific to diesel tractor manufacturers.
- apply retrieved data to diesel tractor conditions.

- communicate technical information to technicians as retrieved from the MitchellI www.tractor-trailer.net.
- apply procedural information, illustrations, diagnostic information, and wiring diagrams to diesel tractors.

DCDT 163 Industrial Software and Systems

Units:	4
Hours:	72 hours LEC
Prerequisite:	None.

This course covers the skills needed to adequately retrieve and apply Cummins INSITE and Eaton diesel engine information using Internet-based technical manuals specifically geared toward diesel tractor emission control systems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- locate, download, and print information specific to Cummins INSITE and diesel engines.
- apply retrieved data to Cummins INSITE and diesel engine conditions.
- communicate technical information to technicians as retrieved from Cummins INSITE and aftermarket diesel software.
- apply procedural information, illustrations, diagnostic information, and wiring diagrams to Cummins INSITE and diesel engines.

DCDT 180 Industrial Fabrication I

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course covers the various processes of welding in transportation and industrial repairs using metal inert gas (MIG) and tungsten inert gas (TIG). Topics include proper safety procedures pertaining to the fabrication of metallic and nonmetallic materials, metallic and nonmetallic fabrication techniques, and various metals and plastics used in fabrication.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- list the types of protective clothing that should be worn in a fabrication shop.
- demonstrate safety precautions while aluminum welding with metal inert gas (MIG) and tungsten inert gas (TIG).
- explain welding equipment components and accessories.
- identify and explain how to sheet .120 steel welding with metal inert gas (MIG) and tungsten inert gas (TIG) on standard, high strength steel (HSS), advanced high strength steel (AHSS), and ultra high strength steel (UHSS), and boron steel.

DCDT 181 Industrial Fabrication II

Units:	4
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Hours:

54 hours LEC; 54 hours LAB

Prerequisite:

None.

This course covers fabrication which involves cutting, altering, and shaping steel or other materials through the use of different tools, techniques, and processes. Topics include hot-gas and airless fabrication techniques, vehicle frames in relation to fabrication, tack welding, and filler material.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain how the chassis frame, side rails, and cross-members can be repaired.
- outline basic frame fabrication techniques.
- explain the difference between pipe used for piping systems versus pipe used for structural applications.
- show how to cut and form 18 gauge to 3/8" steel and aluminum.
- demonstrate how to weld similar and dissimilar metal thicknesses to specification.

DCDT 190 Applied Projects in Clean Diesel Technology

Units:

2

Hours:

108 hours LAB

Prerequisite:

DCDT 101, 110, 120, 130, 140, or 150 with a grade of "C" or better

This course provides laboratory projects in clean diesel technology. Projects are selected by the Diesel Technology Department.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- analyze performance issues in complex clean diesel technology systems.
- apply clean diesel technology system specifications and tolerances to diesel projects.
- demonstrate skills in fabrication and repair techniques.
- construct a complete clean diesel technology project.
- research clean diesel technology information and specifications using printed and Internet sources.

DCDT 200 Light Duty Diesel/Green Diesel Technology

Same As:

AT 156

Units:

4

Hours:

54 hours LEC; 54 hours LAB

Prerequisite:

None.

This course introduces the diagnosis and repair of light duty diesel vehicles and covers the theory and operation of light duty diesel engines and their fuel delivery systems. Topics include diesel engine characteristics, early mechanical fuel delivery systems, early cylinder head design, and early engine construction. It also covers how to prepare these engines for conversion to green technology, such as low sulfur fuel, biodiesel, and alternative fuels. This course along with DCDT 201 is applicable for the field technician seeking training for Automotive Service Excellence (ASE) A9 certification and preparation for green technologies.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- describe the basic operation of diesel fueled vehicles.
- explain the differences between diesel and gasoline engine design.
- diagnose basic diesel engine driveability problems.
- perform basic diesel engine mechanical diagnostic procedures.
- evaluate the diesel fuel injection system's compatibility with low sulfur and biodiesel fuels.

DCDT 201 Advanced Light Duty Diesel/Green Diesel Technology

Same As:	AT 157
Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.

This course focuses on late model turbocharged light duty diesel vehicles operating on low sulfur, biodiesel, or alternative fuels. Topics include computer controlled injection, emission control systems, sensors, actuators, computer modules, exhaust gas recirculation (EGR) systems, particulate traps, selective catalytic reduction (SCR) systems, and lean oxides of nitrogen (NOx) traps. It covers diagnosis and repair of these systems using computer diagnostic equipment to meet state emission compliance. This course along with DCDT 200 is applicable for the field technician seeking training for Automotive Service Excellence (ASE) A9 certification and preparation for green technologies.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the operation of common rail diesel fuel injection systems.
- explain the differences between late model diesel and older diesel engine design.
- diagnose basic driveability problems on late model diesel vehicles.
- perform basic diesel engine turbocharger diagnostic procedures.
- evaluate high pressure fuel system compatibility with biofuels and biofuel impact on diesel emissions.
- test diesel engine emissions and emission control systems.

DCDT 280 Professionalism in the Industry

Units:	3
Hours:	45 hours LEC; 27 hours LAB
Prerequisite:	None.

This course introduces students to the professionalism and soft skills in the heavy duty clean diesel workplace. It provides an in-depth review of skills needed, ranging from applying for jobs, interviewing by panel, professional behavior, proper diesel technology phrases used in the workplace, how to communicate professionally with clients and other employees, and many other topics for the professional diesel technician work etiquette.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- create a professional and concise resume for the clean diesel industry.
- demonstrate interviewing skills within the diesel repair industry.
- describe basic customer service skills as a clean diesel technician.
- discuss examples of appropriate clean diesel technology etiquette in the workplace.

DCDT 281 Diesel Shop Operations

Units:	4
Hours:	72 hours LEC
Prerequisite:	None.

This course introduces operations of dealerships, independent shops, and fleet shops. It emphasizes the various influences that affect the technician's position with the various operations. Topics include service, sales, parts, and financial operations. Customer Satisfaction Index (CSI) is also discussed. Field trips to local shops may be required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- identify all of the dealership's departments and their functions.
- critique dealership, independent, and fleet shop operations.
- analyze and evaluate the advantages and disadvantages of working in dealerships, independent shops, and fleet shops.

DCDT 298 Work Experience in Clean Diesel Technology

Same As:	ACT 298
Units:	1 - 4
Hours:	60 - 300 hours LAB
Prerequisite:	None.
Enrollment Limitation:	Students must be in a paid or unpaid internship, volunteer position, or job related to the clean diesel technology field with a cooperating site supervisor. Students are advised to consult with the Diesel Department faculty to review specific certificate and degree work experience requirements.
Advisory:	Eligible for ENGRD 310 or ENGRD 312 AND ENGWR 300; OR ESLR 340 AND ESLW 340.
General Education:	AA/AS Area III(b)

This course provides students with opportunities to develop marketable skills in preparation for employment or advancement within the clean diesel technology field. It is designed for students interested in work experience and/or internships in associate degree level or certificate occupational programs. Course content includes understanding the application of education to the workforce, completion of Title 5 required forms which document the student's progress and hours spent at the work site, and developing workplace skills and competencies.

During the semester, the student is required to complete 75 hours of related paid work experience, or 60 hours of related unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. All students are required to attend the first class meeting, a mid-semester meeting, and a final meeting. Additionally, students who have not already successfully completed a Work Experience course will be required to attend weekly orientations while returning participants may meet individually with the instructor as needed. Students may take up to 16 units total across all Work Experience course offerings. This course may be taken up to four times when there are new or expanded learning objectives. Only one Work Experience course may be taken per semester.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- demonstrate mastery of specific job skills in the clean diesel technology field related to an associate degree or certificate occupational program level career as written in the minimum three (3) learning objectives created by the student and his/her employer or work site supervisor at the start of the course.
- make effective decisions, use workforce information, and manage his/her personal career plans.
- behave professionally, ethically, and legally at work, consistent with applicable laws, regulations, and organizational norms.
- behave responsibly at work, exhibiting initiative and self-management in situations where it is needed.
- apply effective leadership styles at work, with consideration to group dynamics, team and individual decision making, and workforce diversity.
- communicate in oral, written, and other formats, as needed, in a variety of contexts at work.
- locate, organize, evaluate, and reference information at work.
- demonstrate originality and inventiveness at work by combining ideas or information in new ways, making connections between seemingly unrelated ideas, and reshaping goals in ways that reveal new possibilities using critical and creative thinking skills such as logical reasoning, analytical thinking, and problem-solving.

DCDT 1000 ASE Diesel Engines (T2)

Units:	0.25
Hours:	4.5 hours LEC
Prerequisite:	None.

This course prepares the Medium/Heavy Duty Truck Technician for taking the Automotive Service Excellence (ASE) Exam for the Diesel Engines T2 certification test.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the ASE certificate exam requirements.
- utilize ASE test taking strategies.
- understand how the ASE exam is scored.
- discuss general engine diagnostics, including cylinder head, valve train, and engine block diagnosis and repair.
- summarize the diagnosis and repair of lubrication, cooling, air induction, exhaust, and fuel systems.
- explain starting and charging systems diagnosis and repair.

DCDT 1001 ASE Drive Train (T3)

Units:	0.25
Hours:	4.5 hours LEC
Prerequisite:	None.

This course prepares the Medium/Heavy Duty Truck Technician for taking the Automotive Service Excellence (ASE) Exam for the Drive Train T3 certification

test.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the ASE certificate exam requirements.
- utilize ASE test taking strategies.
- understand how the ASE exam is scored.
- explain clutch and transmission diagnosis and repair.
- summarize drive shaft, universal joint, and drive axle diagnosis and repair.

DCDT 1002 ASE Brakes (T4)

Units:	0.25
Hours:	4.5 hours LEC
Prerequisite:	None.

This course prepares the Medium/Heavy Duty Truck Technician for taking the Automotive Service Excellence (ASE) Exam for the Brakes T4 certification test.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the ASE certificate exam requirements.
- utilize ASE test taking strategies.
- describe how the ASE exam is scored.
- summarize air brake diagnosis and repair.
- discuss air supply and service systems.
- discuss the mechanical foundation, wheel hub, and parking brakes.
- illustrate hydraulic brakes diagnosis and repair.
- describe Air and Hydraulic Antilock Brakes Systems (ABS), Automatic Traction Control (ATC), and Electronic Stability Control Systems.

DCDT 1003 ASE Suspension & Steering (T5)

Units:	0.25
Hours:	4.5 hours LEC
Prerequisite:	None.

This course prepares the Medium/Heavy Duty Truck Technician for taking the Automotive Service Excellence (ASE) Exam for the Suspension and Steering T5 certification test.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the ASE certificate exam requirements.

- utilize ASE test taking strategies.
- summarize how the ASE exam is scored.
- discuss steering system, suspension, frame, and 5th wheel diagnosis and repair.
- describe wheel alignment diagnosis, adjustment, and repair.

DCDT 1004 ASE Electrical/Electronic Systems (T6)

Units:	0.25
Hours:	4.5 hours LEC
Prerequisite:	None.

This course prepares the Medium/Heavy Duty Truck Technician for taking the Automotive Service Excellence (ASE) Exam for the Electrical/Electronic Systems T6 certification test.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the ASE certificate exam requirements.
- utilize ASE test taking strategies.
- understand how the ASE exam is scored.
- summarize general electrical/electronic system diagnosis, and battery and starting system diagnosis and repair.
- explain lighting and vehicle systems diagnosis and repair.

DCDT 1005 ASE Industrial Refrigeration Systems (T7)

Units:	0.25
Hours:	4.5 hours LEC
Prerequisite:	None.

This course prepares the Medium/Heavy Duty Truck Technician for taking the Automotive Service Excellence (ASE) Exam for the Industrial Refrigeration Systems T7 certification test.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the ASE certificate exam requirements.
- utilize ASE test taking strategies.
- summarize how the ASE exam is scored.
- discuss HVAC systems and a/c system and component diagnosis, service, and repair.
- discuss heating and engine cooling systems, operating systems, and related controls diagnosis and repair.

DCDT 1006 ASE Preventive Maintenance Inspection (T8)

Units:	0.25
Hours:	4.5 hours LEC
Prerequisite:	None.

This course prepares the Medium/Heavy Duty Truck Technician for taking the Automotive Service Excellence (ASE) Exam for the Preventive Maintenance T8 certification test.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the ASE certificate exam requirements.
- utilize ASE test taking strategies.
- summarize how the ASE exam is scored.
- discuss engine systems, cab, and hood.
- explain automotive electrical/electronics and frame and chassis, including brakes, drivetrain, steering, tires, wheels, suspension, frame, and 5th wheel.
- describe the road/operational test.

DCDT 1007 ASE Light Vehicle Diesel Engines (A9)

Units:	0.25
Hours:	4.5 hours LEC
Prerequisite:	None.

This course prepares the Medium/Heavy Duty Truck Technician for taking the Automotive Service Excellence (ASE) Exam for the Light Vehicle Diesel Engine A9 certification test.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- explain the ASE certificate exam requirements.
- utilize ASE test taking strategies.
- summarize how the ASE exam is scored.
- discuss general diagnostics, cylinder head and valve train diagnosis and repair, and engine block diagnosis and repair.
- describe lubrication and cooling systems diagnosis and repair, air induction and exhaust systems diagnosis and repair, and fuel systems diagnosis and repair.

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