Area: Technical Education
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Diesel Engine Technology Certificate and Light Duty Diesel Truck Certificate
(added per June 2019 Addendum)
DCDT 280 and DCDT 1000-1007
(new courses, see June 2019 Addendum for listings)

Degree: A.S. - Diesel Technology
Certificates: Diesel Technology
Clean Diesel Technology
Clean Diesel Hybrid Technology
Clean Diesel Management Systems
Diesel Engine Technology
Light Duty Diesel Truck
Preventive Maintenance

DEGREES AND CERTIFICATES

Diesel Technology Degree

Major Code: 011039A01

The Diesel Technology 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.

Career Opportunities

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

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.

Requirements for Degree		28 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

Associate Degree Requirements: The Diesel Mechanics 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.

Diesel Technology Certificate

Major Code: 011039C01

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

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.

Career Opportunities

This certificate prepares the students for various entry level positions exist in the diesel repair industry, such as entry level technician.

See **losrios.edu/gainful-emp-info/gedt.php?major=011039C01** for Gainful Employment Disclosure.

Requirements for Certificate		24 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

Clean Diesel Technology Certificate

Major Code: 011040C01

The Clean Diesel Technology certificate covers the diesel engine systems. Topics include biodiesel fuel and fuel systems, clean diesel technology, and clean diesel software support.

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.

Career Opportunities

This certificate prepares the students for various entry level positions in the diesel repair industry, such as entry level technician, hydraulic technician, and heavy equipment service advisor.

See **losrios.edu/gainful-emp-info/gedt.php?major=011040C01** for Gainful Employment Disclosure.

Requirements for Certificate		24 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

Diesel Engine Technology Certificate

Major Code: 011281C01

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

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 Opportunities

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

Requirements for Certificate		20 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

Clean Diesel Hybrid Technology Certificate

Major Code: 011285C01

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.

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.

Career Opportunities

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

Requirements for Certificate		16 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

Clean Diesel Management Systems Certificate

Major Code: 011280C01

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.

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.

Career Opportunities

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

Requirements for Certificate		16 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

Light Duty Diesel Truck Certificate

Major Code: 011282C01

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.

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 Opportunities

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.

Requirements for Certificate		23 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

Preventive Maintenance Certificate

Major Code: 011041C01

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.

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 Opportunities

This certificate prepares the students for various entry level positions in the diesel repair industry.

Requirements for Certificate		12 Units
DCDT 100	Diesel Technology Basics	4
DCDT 101	Diesel Preventive Maintenance	4
DCDT 110	Diesel Engine Repair	4

Diesel/Clean Diesel Technology

DCDT 100 Diesel Technology Basics 4 Units
Hours: 72 hours LEC

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

DCDT 101 Diesel Preventive Maintenance 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 102 Biodiesel Fuel and Fuel Systems 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 103 Clean Diesel Systems 4 Units
Hours: 54 hours LEC; 54 hours LAB

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

DCDT 104 Clean Diesel Rebuild, Retrofit, Repower, Retire 4 Units
Hours: 54 hours LEC; 54 hours LAB

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

DCDT 107 Hybrid Diesel Power Trains 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 108 Hybrid Diesel High Voltage Systems 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 109 Hybrid Diesel Component Application 4 Units
Hours: 54 hours LEC; 54 hours LAB

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

DCDT 110 Diesel Engine Repair 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 111 Clean Natural Gas Engine Repair 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 112 Clean Diesel Retrofit 4 Units
Hours: 54 hours LEC; 54 hours LAB

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

DCDT 113 Diesel Hybrid Motor Generators 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 120 Basic Hydraulic Principles of Diesel Technology 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 130 Diesel Brake Systems 4 Units
Hours: 54 hours LEC; 54 hours LAB

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

DCDT 140 Diesel Electrical Systems 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 142 Diesel Emission Control Systems 4 Units
Hours: 54 hours LEC; 54 hours LAB

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

DCDT 150 Diesel Power Trains 4 Units
Hours: 54 hours LEC; 54 hours LAB

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

DCDT 162 Clean Diesel Software Support 4 Units
Hours: 72 hours LEC

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.

DCDT 163 Industrial Software and Systems 4 Units
Hours: 72 hours LEC

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.

DCDT 180 Industrial Fabrication I 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 181 Industrial Fabrication II 4 Units
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 190 Applied Projects in Clean Diesel Technology 2 Units
Prerequisite: DCDT 101, 110, 120, 130, 140, or 150 with a grade of "C" or better
Hours: 108 hours LAB

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

DCDT 200 Light Duty Diesel/Green Diesel Technology 4 Units
Same As: AT 156
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 201 Advanced Light Duty Diesel/ Green Diesel Technology 4 Units
Same As: AT 157
Hours: 54 hours LEC; 54 hours LAB

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.

DCDT 281 Diesel Shop Operations 4 Units
Hours: 72 hours LEC

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.

DCDT 298 Work Experience in Clean Diesel Technology 1-4 Units
Same As: ACT 298
Advisory: Eligible for ENGRD 310 or ENGRD 312 AND ENGWR 300; OR ESLR 340 AND ESLW 340.
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.
General Education: AA/AS Area III(b)
Hours: 60-300 hours LAB

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 ours 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.