

Area: Technical Education  
 Dean: Dr. Trish Caldwell  
 Phone: (916) 484-8354  
 Counseling: (916) 484-8572

Degree: A.S. - Diesel Technology  
 Certificates: Diesel Technology  
 Clean Diesel Technology  
 Clean Diesel Hybrid Technology  
 Clean Diesel Management Systems  
 Preventive Maintenance

<http://wserver.arc.losrios.edu/~tech/>

## 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](http://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](http://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

## 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

## 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 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 298 Work Experience in Clean Diesel Technology 1-4 Units***Advisory: Eligible for ENGRD 310 or ENGRD 312 AND ENGRD 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 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.