



Diesel Mechanics (DEM)

Program Information

The Diesel Mechanics Program at Trenholm State Community College is designed to teach a student the basic principles required in the repair and maintenance of components in the trucking, equipment, and farm related industries. The student will gain hands-on experience repairing, troubleshooting, and rebuilding various components in these areas.

Occupational Choices

Employment of diesel mechanics is expected to grow 15 percent from 2010 to 2020, about as fast as the average for all occupations. As more freight is shipped across the country, additional diesel-powered trucks will be needed. As a result, diesel mechanics will be needed to maintain and repair the nation's truck fleet. Demand for new workers in the freight trucking and automotive repair and maintenance industries is expected to drive overall diesel mechanic job growth. Some older vehicles will need to be retrofitted and modernized to comply with environmental regulations, creating additional jobs for diesel mechanics. Overall employment growth, however, may be dampened due to increasing durability of new truck and bus diesel engines. Continuing advances in repair technology, including computerized diagnostic equipment, also will result in fewer mechanics doing the same amount of work, further reducing demand for mechanics.

Job opportunities should be good for those who have completed formal postsecondary education and have strong technical skills, as employers sometimes report difficulty finding qualified workers. Workers without formal training often require more supervision and on-the-job instruction than others—an expensive and time-consuming process for employers. Because of this, untrained candidates will face strong competition for jobs.

Source: Bureau of Labor and Statistics Occupational Outlook Handbook, 2016-2017 Edition, 2015 Survey

Average Full-Time Wage

The median annual wage for diesel service technicians and mechanics was \$44,520 in May 2015. The median wage is the wage at which half the workers in an occupation earned more than that amount and half earned less. The lowest 10 percent earned less than \$28,680, and the highest 10 percent earned more than \$66,940.

Source: Bureau of Labor and Statistics Occupational Outlook Handbook, 2016-2017 Edition, 2015 Survey

Awards Available

Certificate in Diesel Mechanics

Short Term Certificate

Diesel Mechanics

Diesel Engine Concentration

Drive Train Concentration

Electrical/Electronics Concentration

Engine Rebuild Concentration

Program Contact

James Shedd

Program Coordinator/Instructor

334-420-4365

Location: Patterson Campus - Bldg. L

As part of ongoing planning and evaluation, the College regularly evaluates student learning outcomes for each program.

Estimated Program Length & Cost *

<u>Award</u>	<u>Length</u>	<u>Credit Hours</u>	<u>Tuition Fees</u>	<u>Books</u>	<u>Tools</u>	<u>Supplies</u>
Certificate	5 Terms	60	\$8,700	\$172	\$600	\$0
Short Term Certificate	1 Term	12	\$1,740	\$60	\$0	\$0
Short Term Certificate	1 Term	13	\$1,885	\$60	\$0	\$0

* Tax not included. Prices are subject to change without prior notice; cost of books may vary considerably among suppliers. Cost of general education books is in addition to the total listed above. The length of the program is based on full-time status of 12-15 credit hours per term. Enrollment in transitional level general education courses will alter the length of the program.

Certificate Diesel Mechanics

Required Technical Courses (47 credit hours)

Course	Title	Hrs
DEM-104	Basic Engines	3
DEM-117	Diesel and Gas Tune-Up	3
DEM-119	Bearings and Lubricants	3
DEM-122	Heavy Vehicle Brakes	3
DEM-123	Pneumatics and Hydraulics	3
DEM-125	Heavy Vehicle Drive Trains	3
DEM-126	Advanced Engines	3
DEM-128	Power Train Lab	3
DEM-129	Diesel Engine Lab	3
DEM-130	Electrical / Electronic Fundamentals	3
DEM-133	Gas Engine Lab	3
DEM-145	Electrical Schematics and Symbols	3
DEM-146	Engine Fundamentals	3
DEM-147	Fuel and Ignition Systems	3
DEM-181	Special Topics in Electrical	3
DEM-191	Special Projects in Diesel Mechanics	2

Required General Education (13 credit hours)

Course	Title	Hrs
DPT-103	Introductory Computer Skills	3
ENG-100	Vocational Technical English	3
MAH-101	Introductory Mathematics I	3
ORI-101	Orientation to College	1
SPC-103	Oral Communication Skills	3

Total Hours: 60 Credit Hours; 1,664 Contact Hours

Short Term Certificate Diesel Mechanics Diesel Engine Concentration

Required Technical Courses (12 credit hours)

Course	Title	Hrs
DEM-104	Basic Engines	3
DEM-117	Diesel and Gas Tune-Up	3
DEM-126	Advanced Engine Analysis	3
DEM-129	Diesel Engine Lab	3

Required General Education (1 credit hour)

ORI-101	Orientation to College	1
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Total Hours: 13 Credit Hours; 400 Contact Hours

Short Term Certificate Diesel Mechanics Drive Train Concentration

Required Technical Courses (12 credit hours)

Course	Title	Hrs
DEM-122	Heavy Vehicle Brakes	3
DEM-123	Pneumatics and Hydraulics	3
DEM-125	Heavy Vehicle Drive Trains	3
DEM-128	Power Train Lab	3

Required General Education (1 credit hours)

Course	Title	Hrs
ORI-101	Orientation to College	1

Total Hours: 13 Credit Hours; 400 Contact Hours

Short Term Certificate Diesel Mechanics Electrical/Electronics Concentration

Required Technical Courses (11 credit hours)

Course	Title	Hrs
DEM-130	Electrical / Electronic Fundamentals	3
DEM-145	Electrical Schematics and Symbols	3
DEM-181	Special Topics in Electrical	3
DEM-191	Special Projects in Diesel Mechanics	2

Required General Education (1 credit hours)

Course	Title	Hrs
ORI-101	Orientation to College	1

Total Hours: 12 Credit Hours; 304 Contact Hours

Short Term Certificate Diesel Mechanics Engine Rebuild Concentration

Required Technical Courses (12 credit hours)

Course	Title	Hrs
DEM-119	Bearings and Lubricants	3
DEM-133	Gas Engine Lab	3
DEM-146	Engine Fundamentals	3
DEM-147	Fuel and Ignition Systems	3

Required General Education (1 credit hours)

Course	Title	Hrs
ORI-101	Orientation to College	1

Total Hours: 13 Credit Hours; 400 Contact Hours

Course Descriptions for Diesel Mechanics (DEM)

Course #	Course Title	Theory Contact Hours/Wk	Lab Contact Hours/Wk	Credit Hours
DEM-104	BASIC ENGINES PREREQUISITE: None This course is designed to give the student knowledge of the diesel engine components and auxiliary systems, the proper way to maintain them, and the proper procedures for testing and rebuilding components. Emphasis is placed on safety, theory of operation, inspection, and measuring and rebuilding diesel engines according to factory specifications. Upon completion students should be able to measure, diagnose problems, and repair diesel engines. This is a CORE course.	1	4	3
DEM-117	DIESEL AND GAS TUNE-UP PREREQUISITE: None This course introduces tune-up and troubleshooting according to manufacturers' specifications. Topics include troubleshooting engine systems, tune-up procedures, and use and care of special test tools and equipment. Upon completion, students should be able to troubleshoot, diagnose, and repair engines and components using appropriate diagnostic equipment.	1	4	3
DEM-119	BEARINGS AND LUBRICANTS PREREQUISITE: None This course focuses on roller, ball and shell bearing design and application. Topics include vehicle and industrial bearings and lubrication requirements. Upon course completion, students should diagnose related problems and service and replace bearings.	1	4	3
DEM-122	HEAVY VEHICLE BRAKES COREQUISITE: DEM-125 This course covers the theory and repair of braking systems used in medium and heavy duty vehicles. Topics include hydraulic and ABS system diagnosis and repair. Upon completion, students should be able to troubleshoot, adjust, and repair braking systems on medium and heavy duty vehicles. This is a CORE course.	1	4	3
DEM-123	PNEUMATICS AND HYDRAULICS PREREQUISITE: None This course provides instruction in the identification and repair of components found in hydraulic systems. Topics include schematics circuits and symbols used in fluid power transmission and the troubleshooting of components in these systems. Upon completion, students should be able to diagnose, adjust, and repair hydraulic system components.	1	4	3
DEM-125	HEAVY VEHICLE DRIVE TRAINS PREREQUISITE: None This course introduces the operating principles of mechanical medium and heavy duty vehicle transmissions. Topics include multiple counter shafts, power take-offs, slider idler clutches, friction clutches, mechanical transmission power components, and hydraulics. Upon completion, students should be able to diagnose, inspect, and repair mechanical transmissions. This is a CORE course.	1	4	3
DEM-126	ADVANCED ENGINE ANALYSIS PREREQUISITE: None This course provides instruction in the disassembly, inspection, and rebuilding of diesel and heavy-duty gas engines. Emphasis is placed on the manufacturer's standards and factory recommended service tools and equipment. Upon completion, students should be able to disassemble, inspect, and rebuild engines according to the manufacturer's specifications.	1	4	3
DEM-128	HEAVY VEHICLE DRIVE TRAIN LAB COREQUISITE: DEM-125 PREREQUISITE: None This lab provides reinforcement of material covered in DEM 125. The students will apply the knowledge they learned on driveshafts, power take-offs, standard transmissions, fluid drives, torque converters, clutch assemblies, drive axles, and special drives through experiential learning techniques. Upon completion, students should be able to diagnose, inspect, remove, repair or replace, and install heavy vehicle drive train components.	0	9	3

Course #	Course Title	Theory Contact Hours/Wk	Lab Contact Hours/Wk	Credit Hours
DEM-129	DIESEL ENGINE LAB PREREQUISITE: None This lab allows the student to refine the skills required to repair diesel engines.	0	9	3
DEM-130	ELECTRICAL / ELECTRONIC FUNDAMENTALS PREREQUISITE: None This course introduces the student to basic Electrical / Electronic concepts and fundamentals. It provides the principles of electricity, magnetism, and Ohm's Law. Emphasis is placed on batteries, starting, charging, and lighting circuits, which include series, parallel, and series-parallel circuits. Troubleshooting and repair of wiring harnesses, starting motors, charging systems, and accessories are included along with the computerized monitoring of vehicle systems. Upon completion, students should be able to identify components, test systems, and repair minor electrical problems according to manufacturer's literature. This is a CORE course.	1	4	3
DEM-133	GAS ENGINE LAB PREREQUISITE: None This course allows the student to develop the skills required to repair industrial gas engines.	0	9	3
DEM-145	ELECTRICAL SCHEMATICS AND SYMBOLS PREREQUISITE: None This course introduces the student to electrical symbols and schematics. It prepares the student to utilize wiring diagrams and schematics to troubleshoot electrical problems. Upon completion students should be able to understand electrical circuits by reading wiring diagrams.	3	0	3
DEM-146	ENGINE FUNDAMENTALS PREREQUISITE: None This course introduces students to procedures and components of spark ignition engines.	1	4	3
DEM-147	FUEL AND IGNITION SYSTEMS PREREQUISITE: None This course introduces the student to the operating principles and concepts related to fuel and ignition systems.	1	4	3
DEM-181	SPECIAL TOPICS IN ELECTRICAL PREREQUISITE: None This course provides specialized instruction in various areas related to the electrical systems of the diesel mechanics industry. Emphasis is placed on meeting students' needs.	0	6	3
DEM-191	SPECIAL PROJECTS IN DIESEL MECHANICS PREREQUISITE: None This course provides information on current trends in diesel mechanics as they relate to employment responsibilities. Topics may vary by term to reflect relevant training needs by the industry.	1	3	2
DEM-192	CO-OP ELECTIVE PREREQUISITE: As required by College This course allows the student to work parallel in a job closely related to the student's major while attending college. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.	0	3	3
DEM-193	CO-OP ELECTIVE PREREQUISITE: As required by College This course allows the student to work parallel in a job closely related to the student's major while attending college. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.	0	3	3
DEM-194	CO-OP ELECTIVE PREREQUISITE: As required by College This course allows the student to work parallel in a job closely related to the student's major while attending college. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.	0	3	3

Course #	Course Title	Theory Contact Hours/Wk	Lab Contact Hours/Wk	Credit Hours
DEM-195	CO-OP ELECTIVE PREREQUISITE: As required by College This course allows the student to work parallel in a job closely related to the student's major while attending college. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.	0	3	3
DEM-201	CO-OP ELECTIVE PREREQUISITE: As required by College This course allows the student to work parallel in a job closely related to the student's major while attending college. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.	0	3	3
DEM-202	CO-OP ELECTIVE PREREQUISITE: As required by College This course allows the student to work parallel in a job closely related to the student's major while attending college. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.	0	3	3
DEM-203	CO-OP ELECTIVE PREREQUISITE: As required by College This course allows the student to work parallel in a job closely related to the student's major while attending college. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.	0	3	3
DEM-204	CO-OP ELECTIVE PREREQUISITE: As required by College This course allows the student to work parallel in a job closely related to the student's major while attending college. The grade is based on the employer's evaluation of the student's productivity, an evaluation work report submitted by the student, and the student's learning contract.	0	3	3