Diesel/On-Site Power Generation Technology

(1.5 to 2 Years)

Two Advanced Technical Certificate options, two Associate of Applied Science degrees, and a Bachelor of Applied Science degree are available.

Students wishing to complete the On-Site Power Generation Technology portion of the program may have a break in their training between the completion of the Diesel Technology coursework and the beginning of the On-Site Power Generation Technology coursework.

Objective

To produce graduates who can perform complex diagnostic operations, repair, and maintain the latest heavy truck, agricultural, or mining related diesel equipment; to include an option to complete training in diesel electric generator repair.

For a Program Information Packet showing descriptions of each option, course descriptions, lists of course sequences, and the cost of books, tools, uniforms, fees, and other expenses, go online to https://www.isu.edu/dieseltechnology/.

Successful completion (D- or better) of each course is required before the student can progress in the program.

Faculty

Coordinator and Clinical Senior Instructor


Clinical Senior Instructor


Instructors


Advanced Technical Certificate: Diesel Technology

(1.5 Years)

Required Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESL 0115</td>
<td>Diesel Hydraulics I</td>
<td>2</td>
</tr>
<tr>
<td>DESL 0117</td>
<td>Heavy Duty Brake Systems</td>
<td>2</td>
</tr>
<tr>
<td>DESL 0125</td>
<td>Heavy Duty Power Trains</td>
<td>8</td>
</tr>
<tr>
<td>DESL 0184</td>
<td>Diesel Engine Technology</td>
<td>5</td>
</tr>
<tr>
<td>DESL 0186</td>
<td>Diesel Engine Electrical Systems</td>
<td>2</td>
</tr>
<tr>
<td>DESL 0190</td>
<td>Diesel Engine Emission Systems</td>
<td>1</td>
</tr>
<tr>
<td>DESL 0207</td>
<td>Advanced Diesel Electrical Systems</td>
<td>2</td>
</tr>
<tr>
<td>DESL 0215</td>
<td>Advanced Hydraulics</td>
<td>4</td>
</tr>
<tr>
<td>DESL 0217</td>
<td>Advanced Engine Electronics Systems</td>
<td>4</td>
</tr>
<tr>
<td>DESL 0231</td>
<td>Live Work Capstone Class</td>
<td>8</td>
</tr>
<tr>
<td>or DESL 0232</td>
<td>Internship Capstone Class</td>
<td></td>
</tr>
<tr>
<td>TGE 0158</td>
<td>Employment Strategies</td>
<td>2</td>
</tr>
<tr>
<td>TGE 1150</td>
<td>Applied Social Sciences in the Workplace</td>
<td>3</td>
</tr>
<tr>
<td>COMM 1101</td>
<td>Principles of Speech ¹</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 58

Elective Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESL 0298</td>
<td>Special Topics</td>
<td>1-8</td>
</tr>
<tr>
<td>WELD 0105</td>
<td>Welding</td>
<td>1-4</td>
</tr>
</tbody>
</table>

¹ Contributes to a General Education requirement.

Advanced Technical Certificate: On-Site Power Generation Technology

(2 Years)

Required Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESL 0101</td>
<td>Safety and Introduction to Shop Practices</td>
<td>2</td>
</tr>
<tr>
<td>DESL 0102</td>
<td>Introduction to Electrical</td>
<td>1</td>
</tr>
<tr>
<td>DESL 0103</td>
<td>Electrical Systems</td>
<td>3</td>
</tr>
<tr>
<td>DESL 0107</td>
<td>Basic Diesel Electrical Systems</td>
<td>2</td>
</tr>
<tr>
<td>DESL 0109</td>
<td>Cab Climate Control</td>
<td>2</td>
</tr>
<tr>
<td>DESL 0113</td>
<td>Diesel Engine Fuel Systems</td>
<td>2</td>
</tr>
<tr>
<td>DESL 0207</td>
<td>Advanced Diesel Electrical Systems</td>
<td>2</td>
</tr>
<tr>
<td>DESL 0215</td>
<td>Advanced Hydraulics</td>
<td>4</td>
</tr>
<tr>
<td>DESL 0217</td>
<td>Advanced Engine Electronics Systems</td>
<td>4</td>
</tr>
<tr>
<td>DESL 0231</td>
<td>Live Work Capstone Class</td>
<td>8</td>
</tr>
<tr>
<td>or DESL 0232</td>
<td>Internship Capstone Class</td>
<td></td>
</tr>
<tr>
<td>TGE 0241</td>
<td>On Site Power Generation I</td>
<td>8</td>
</tr>
<tr>
<td>TGE 0243</td>
<td>On Site Power Generation II</td>
<td>8</td>
</tr>
<tr>
<td>TGE 0158</td>
<td>Employment Strategies</td>
<td>2</td>
</tr>
</tbody>
</table>
TGE 1150  Applied Social Sciences in the Workplace 1  3
COMM 1101  Principles of Speech 1  3
Total Credits  74

Elective Courses:
DESL 0298  Special Topics  1-8
WELD 0105  Welding  1-4

1  Contributes to a General Education requirement.

Associate of Applied Science Degree: Diesel Technology
(2 Years)

Required Courses:
DESL 0101  Safety and Introduction to Shop Practices  2
DESL 0102  Introduction to Electrical  1
DESL 0103  Electrical Systems  3
DESL 0107  Basic Diesel Electrical Systems  2
DESL 0109  Cab Climate Control  2
DESL 0113  Diesel Engine Fuel Systems  2
DESL 0115  Diesel Hydraulics I  2
DESL 0117  Heavy Duty Brake Systems  2
DESL 0125  Heavy Duty Power Trains  8
DESL 0184  Diesel Engine Technology  5
DESL 0186  Diesel Engine Electrical Systems  2
DESL 0190  Diesel Engine Emission Systems  1
DESL 0207  Advanced Diesel Electrical Systems  2
DESL 0215  Advanced Hydraulics  4
DESL 0217  Advanced Engine Electronics Systems  4
DESL 0231  Live Work Capstone Class  8
or DESL 0232  Internship Capstone Class

General Education courses 1
COMM 1101  Principles of Speech 2  3
Additional General Education courses  12
Total Credits  81

1  See General Education Requirements (minimum 15 credits) for A.A.S. Degree at the start of the College of Technology section of the catalog.
2  Contributes to a General Education requirement.

Courses

DESL 0101 Safety and Introduction to Shop Practices: 2 semester hours.
Theory and application of shop safety, tool and equipment usage, precision measuring, basic welding, and oxy-acetylene skills. D

DESL 0102 Introduction to Electrical: 1 semester hour.
Fundamental electrical theory concepts and basic electrical system formulas. F, S

DESL 0103 Electrical Systems: 3 semester hours.
Troubleshooting and repair procedures for heavy-duty electrical systems, including electrical principles as they relate to the components used in trucks and heavy equipment, wiring schematics, and lighting along with the associated testing and repair procedures for each system. Topics include basic electricity fundamentals, starters, charting systems, batteries, troubleshooting, and lighting systems. F, S

DESL 0107 Basic Diesel Electrical Systems: 2 semester hours.
Theory, application, and practice in basic electricity and electronic principles to include wiring circuits, charging, and starting systems found in diesel powered vehicles. Emphasis will be given to diagnosis of electrical systems and use of diagnostic equipment. D

DESL 0109 Cab Climate Control: 2 semester hours.
Fundamentals of mobile air conditioning and heating systems including electronic climate controls and principles, basic refrigeration concepts, evacuation and recharging, and repair and testing of systems. Students will become familiar with environmental regulations and proper disposal of refrigerants. D

DESL 0113 Diesel Engine Fuel Systems: 2 semester hours.
Introduces diesel fuel systems, mechanical fuel pumps, governors, air-to-fuel ratios, and the chemistry of combustion. Classroom theory will be followed by practical lab application including setting valve lash, adjusting injector settings, and other tune-up related procedures to increase efficiency and decrease pollution. D

Associate of Applied Science Degree: On-Site Power Generation Technology
(2 Years)

Required Courses:
DESL 0101  Safety and Introduction to Shop Practices  2
DESL 0102  Introduction to Electrical  1
DESL 0103  Electrical Systems  3
DESL 0115 Diesel Hydraulics I: 2 semester hours.
Provides an introduction to diesel hydraulics and their operation. Basic principles of flow, pressure, and conversion of fluid power into mechanical power; relationship of Pascal's Law and relating it to the fundamentals of hydraulic principles; and identification of the components in a basic hydraulic circuit and variations of those circuits used in modern hydraulic systems. D

DESL 0117 Heavy Duty Brake Systems: 2 semester hours.
Provides an introduction to air and hydraulic brakes, disassembly, hydraulic drum and disc brake maintenance, safe operation of each system, pad and shoe replacement, drum and rotor turning, and anti-lock braking systems. Instruction will cover brake system setup, safety, and final brake system adjustment. D

DESL 0125 Heavy Duty Power Trains: 8 semester hours.
Provides training in heavy duty power train components from engine flywheel through the final drives on heavy duty truck, construction equipment, and farm implements. Practical theory and application to perform repair procedures, troubleshooting, diagnosing, failure analysis, preventative maintenance, and adjustments of heavy-duty power trains. Manually operated, power-shift actuated, electronic controlled transmissions, differentials, and planetary final drives will be covered. D

DESL 0184 Diesel Engine Technology: 5 semester hours.
Instruction in diesel power theory fundamentals and operation of diesel engines in mining, agriculture, and trucking applications. Classroom theory is combined with laboratory sections consisting of overhaul procedures, repair, diagnostic testing, and final adjustment of components or systems. D

DESL 0186 Diesel Engine Electrical Systems: 2 semester hours.
Provides instruction in theory and application of computerized engine management systems, understanding the relationship of electronic components to overall engine performance, and employ diagnostic equipment to test and monitor engine systems. COREQ: DESL 0184 and DESL 0190. PRE-or-COREQ: DESL 0101. D

DESL 0190 Diesel Engine Emission Systems: 1 semester hour.
Provides instruction in theory and application of new federal emissions compliance standards for diesel powered vehicles. Topics include principles of exhaust treatment, testing of emission control devices, emissions monitoring, troubleshooting, and corrective action for emissions compliance and maximum power output. PREREQ: DESL 0101. D

DESL 0207 Advanced Diesel Electrical Systems: 2 semester hours.
Provides instruction and guided practice with all functions of multi-meters and circuit analysis including schematic reading, circuit troubleshooting, and testing of electronic engine components. COREQ: DESL 0115 and DESL 0215. PREREQ: DESL 0102 and DESL 0103. D

DESL 0215 Advanced Hydraulics: 4 semester hours.
Addresses troubleshooting hydraulic and hydrostatic drive systems. Emphasis on the proper use of diagnostic procedures, electronic test equipment, and interpretation of schematic drawings. Perform tests and make repairs to mechanical or electronic components. Students will use a variety of electronic meters to diagnose and correct problems. COREQ: DESL 0107, DESL 0117, and DESL 0207. PREREQ: DESL 0101 and DESL 0115. D

DESL 0217 Advanced Engine Electronics Systems: 4 semester hours.
Provides instruction in theory and operation of electronic control systems, electronic control modules, and electronic governors. Practical application and use of multi-meters, engine diagnostic software, and troubleshooting techniques are provided. COREQ: DESL 0109, DESL 0113, DESL 0125, DESL 0184, DESL 0186, and DESL 0190. PREREQ: DESL 0101 and DESL 0107. D

DESL 0231 Live Work Capstone Class: 8 semester hours.
Synthesis of all prior learning. Provides opportunities for diagnosis, troubleshooting, and service of diesel powered equipment by repairing customer equipment in a controlled lab environment. Includes diagnosis of faults, preparation of service reports, ordering parts, installation of parts for repair, and final testing of all work performed. D

DESL 0232 Internship Capstone Class: 8 semester hours.
Used as a final phase of training in an actual equipment repair facility performing all types of repair work. The participant will utilize all previously learned skills in an industrial setting and will be closely supervised. F, S, Su

DESL 0241 On Site Power Generation I: 8 semester hours.
Principles, diagnosis, repair and trouble shooting on operable on-site power generation equipment. F, S

DESL 0243 On Site Power Generation II: 8 semester hours.
A continuation of DESL 0241. F, S

DESL 0296 Independent Study: 1-8 semester hours.
Addresses specific learning needs of individuals for the enhancement of knowledge and skills within the program area under the guidance of an instructor. May be repeated. Graded S/U, or may be letter-graded. PREREQ: Permission of the instructor. D

DESL 0298 Special Topics: 1-8 semester hours.
Addresses the specific needs of industry, enabling students to upgrade technical skills that are not included in the current program curriculum. May be repeated. Graded S/U, or may be letter-graded. PREREQ: Permission of instructor. D