

Diesel Mechanics

Program Design Summary

Program Information

Organization	Washburn Institute of Technology
Program Number	47.0605
Instructional Level	Certificate
Instructional Area	Mechanical Technology
Instructor	Cyrus Oliver 785-288-6434
Last Revision Date	11/04/10

Target Population

Grades 11 & 12; Post-Secondary

Description

This program prepares individuals to apply technical knowledge and skills to repair, service, and maintain diesel powered equipment. Instruction includes safety, repair, and maintenance of several types of diesel equipment, tune-up and overhauling, transmissions, and differentials. Hands-on experience will be provided on Caterpillar, Mack, Fuller, Allison, and Rockwell Eaton equipment. Related technical instruction will be placed on safety and the proper care and use of tools and test equipment.

Indirect Measures

1. Rating on Competency Profile.
2. Option: Students should raise Key Train score at least one level in the areas of: Applied Math and Reading for Information.

Entry Requirements

1. Complete and pass the Work Keys entrance assessment at a Level 4 in Applied Math and Reading for Information.
2. Students are required to purchase tools and a tool box to work in the career field. A tool rental option is available on a limited basis.
3. Purchase the required Personal Protective Equipment to work in the lab.

Evaluation Summary

Grading Criteria:

Grades shall be awarded on a quarterly basis, following these guidelines:

30% Daily Score - participation, responsibility, stamina, safety, and desire to learn

70% Graded Activities - written and performance assessments

This composite score will be expressed as a part of a scale of 100:

A 90% to 100%

B 80% to 89.9%

C 70% to 79.9%

D 60% to 69.9%

Failing 59.9% and below

All students will be expected to maintain a minimum of 90% attendance and a grade of no less than 70%. Progress reports will be issued do students receiving a substandard grade. Excellence is encouraged.

Safety Expectation:

All students are expected to comply with the safety requirements for Washburn Institute of Technology, Diesel Mechanics Program, and State and Federal regulations. Students who continuously disregard safety rules will be referred to student services for disciplinary action. Safety is evaluated daily.

ADA Notification Statement:

The Special Support Services (SSS) Office is responsible for assisting in arranging accommodations and for identifying resources at Washburn Institute of Technology for persons with disabilities. Qualified students with disabilities **MUST** register and provide documentation with the office to be eligible for services. New requests for accommodations should be submitted two months or more prior to the date services should begin; however, contact the SSS Office as soon as a need may arise. Depending on the accommodation request, four to eight weeks lead time may be needed for timely and effective provision of services. SSS coordinates and assist in arranging services it deems appropriate for eligible students on a case-by-case basis.

If you are a student with a disability that may substantially limit your ability to participate in this class and believe you will need accommodations, it is your responsibility to contact:

Who: Special Support Services Coordinator

Location: Career Resource Center

Phone: 785-228-6356

E-Mail: SSSCoordinator@washburntech.edu

Student may voluntarily identify themselves to the instructor for a referral to the Special Support Services Coordinator.

Program Outcomes

- A. Demonstrate appropriate safe conduct in the work environment.
- B. Demonstrate knowledge in the safe operation of tools and equipment associated with Diesel Mechanics.
- C. Apply acquired Workplace Skills in locating, applying, and obtaining a position in the work place.
- D. Demonstrate entry level skills in Electrical and Hydraulic areas in the field of Diesel Mechanics.
- E. Demonstrate entry level skills in Workplace Tools and Common Materials areas in the field of Diesel Mechanics.
- F. Demonstrate entry level skills in Engine Principles and Procedures areas in the field of Diesel Mechanics.
- G. Demonstrate entry level skills in Fuel Systems and Engine Diagnosis And Maintenance in the field of Diesel Mechanics.
- H. Document entry level knowledge in Power Trains and Demonstrate entry level skills in Disassembly and Assembly of Clutches and Mechanical Transmissions used in the field of Diesel Mechanics.
- I. Demonstrate entry level skills in the Disassembly and Assembly of Automatic Transmissions as well as Differentials and other related systems in the field of Diesel Mechanics.
- J. Demonstrate entry level skills in Steering And Suspensions areas in the field of Diesel Mechanics.
- K. Demonstrate entry level skills in Brakes in the field of Diesel Mechanics
- L. Indicate an increase in general knowledge by scoring one level higher on the exit exam than the

entrance exam.

Core Abilities

- A. Communicate effectively.
 - 1. Learner writes and speaks with clarity
 - 2. Learner employs active listening skills
 - 3. Learner respects others and acknowledges other points of view
 - 4. Learner derives meaning from text, media, and presentations
 - 5. Learner utilizes general and program/industry specific vocabulary
- B. Integrate technology.
 - 1. Learner uses technology to communicate
 - 2. Learner solves problems using technology
 - 3. Learner applies technology to manage information
 - 4. Learner analyzes and applies technology resources effectively
- C. Learn effectively - use academics effectively.
 - 1. Learner listens carefully and follows direction
 - 2. Learner accesses and organizes information from resources
 - 3. Learner can apply and adopt knowledge and skill to changing situations
 - 4. Learner identifies relevant details, facts, and specification
- D. Demonstrate cooperative/teamwork skills
 - 1. Learner works well with others
 - 2. Learner maintains self control
 - 3. Learner adapts to changing environments
 - 4. Learner takes responsibility for accomplishing goals
 - 5. Learner shares responsibility
- E. Apply Safety
 - 1. Learner follows safety standards and rules
 - 2. Learner uses required protective clothing and equipment
 - 3. Learner reports all accidents, injuries and unsafe conditions
 - 4. Learner appropriately handles hazardous materials, tools, and equipment
 - 5. Learner maintains a clean, safe, and orderly work environment
- F. Think critically and creatively
 - 1. Learner identifies possible reasons for needed improvements
 - 2. Learner develops and implements a plan of action
 - 3. Learner uses research and implements changes appropriately
 - 4. Learner uses critical thinking and reasoning skills to identify problems and apply strategies to resolve them
- G. Demonstrate responsible work ethics
 - 1. Learner displays behavior consistent with the ethical standards within a discipline or profession.
 - 2. Learner follows rules, policies, and procedures.
 - 3. Learner accepts responsibilities for his/her actions.
 - 4. Learner exhibits dress appropriate to the professional when in the real or simulated work setting.
 - 5. Learner demonstrates skills necessary to resolve conflict.

6. Learner attends class as mandated by the instructor.

External Standards

Course Configuration			
Course #	Course Title	Credits	Required?
DM110	Safety Skills	2	Yes
DM130	Intro to Diesel 1	5	Yes
DM135	Intro to Diesel 2	5	Yes
DM140	Engines 1	6	Yes
DM145	Engines2	6	Yes
DM240	Power Trains 1	5	Yes
DM245	Power Trains 2	5	Yes
DM220	Workplace Skills	2	Yes
DM260	Steering & Suspension	7	Yes
DM270	Brakes	5	Yes
DM280	Diesel OJT	3	No

Program Course Detail

Safety Skills

Course Number	DM110
Credits	2
Category	Core Course
Required	Yes
Course Description	Instruction will consist of three units: General Safety, Workplace Safety, and First Aid. The instructional methods used will consist of lecture and laboratory exercises. Equipment operation instruction will be given to small groups. Students will not be allowed to operate any equipment until they have successfully demonstrated the ability to operate the shop equipment safely and have scored at least 85% on the written test. Students will be expected to observe and comply with all safety rules and regulations.

Intro to Diesel 1

Course Number	DM130
Credits	5
Category	Core Course
Required	Yes
Course Description	The Introduction to Diesel Technology course will consist of: workplace tools- types, care, and maintenance; proper care and use of precision instruments as applied within the field of Diesel Mechanics; the care and use of tools used to form threads, both internal and external; thread repair and broken fastener removal. Instruction Methods used will consist of classroom and laboratory exercises. Students will be expected to observe and comply with all

safety rules and regulations.

Intro to Diesel 2

Course Number

DM135

Credits

5

Category

Core Course

Required

Yes

Course Description

The Introduction to Diesel Technology 2 course consists of: Principles of Basic Electricity and Hydraulics, Basic Welding and Cutting techniques, and their associated hardware. Instruction methods consist of classroom and/or laboratory exercises. Students will be expected to observe and comply with all safety rules and regulations. Pre-requisite: DM130.

Engines 1

Course Number

DM140

Credits

6

Category

Core Course

Required

Yes

Course Description

The Engines 1 course includes characteristics and principles of diesel fueled internal combustion engine. Classroom and/or laboratory activities will include the procedures in disassembly, wear analysis and failure analysis of diesel component parts. Students will be expected to observe and comply with all safety rules and regulations.

Engines2

Course Number

DM145

Credits

6

Category

Core Course

Required

Yes

Course Description

The Engines 2 course will include classroom and/or shop exercises: basic principles of the various engine systems, the disassembly and inspection, reconditioning of component parts to include various fuel systems. In addition, engine diagnosis and maintenance will be discussed and performed in various engine systems. Students will be expected to observe and comply with all safety rules. Pre-requisite: DM140.

Power Trains 1

Course Number

DM240

Credits

5

Category

Core Course

Required

Yes

Course Description

The Power Trains 1 course will include classroom and/or shop exercises in: characteristics and principles of Power Trains units. Specific topics include: Introduction to Diesel Drive Trains, Drive

Shafts, Power Take-Offs, and Standard Transmissions. Also the procedures in disassembly, wear analysis, and failure analysis. Instruction will be included in these types of transmissions and differentials: Mack, Rockwell Eaton and Dana Spicer. Students will be expected to observe and comply with all safety rules and regulations.

Power Trains 2

Course Number

DM245

Credits

5

Category

Core Course

Required

Yes

Course Description

The Power Trains 2 course will include classroom and/or shop exercises in the following Power Trains units: Automatic Transmission and Torque Converters, Clutches, Drive Axles, Special Drives; and procedures in disassembly, wear analysis, and failure analysis in Power Trains. Instruction will include these types of transmissions and differentials: Mack, Rockwell Eaton, Arvin Meritor, and Dana Spicer. Students will be expected to observe and comply with all safety rules and regulations. Pre-requisite: DM240.

Workplace Skills

Course Number

DM220

Credits

2

Required

Yes

Course Description

The Workplace Skills course will include classroom and/or shop exercises in the following three units: Introduction to Diesel Technology, Workplace Communication and Customer Service, and Job Application. Students will be expected to observe and comply with all safety rules and regulations.

Steering & Suspension

Course Number

DM260

Credits

7

Category

Core Course

Required

Yes

Course Description

Steering And Suspensions course will include classroom and/or shop exercises in: components and types of Steering and Suspensions used in Medium and Heavy Truck; and procedures in disassembly, wear analysis and failure analysis. In the basic principles of various steering and suspension systems, the disassembly and inspection will include reconditioning of component parts. In addition, a unit on basic vehicle alignment is taught. Students will be expected to observe and comply with all safety rules and regulations.

Brakes

Course Number

DM270

Credits

5

Category	Core Course
Required	Yes
Course Description	The Brakes course will include classroom and/or laboratory activities in components and types of braking systems for medium and heavy trucks. Brakes curriculum include: basic principles of braking systems, disassembly and inspection of brakes, reconditioning of component parts. Also covered are standards to address Anti-lock Systems: FMVSS 105 (Hydraulic Brakes) and FMVSS 121 (Air Brakes). Students will be expected to observe and comply with all safety rules and regulations.

Diesel OJT	
Course Number	DM280
Credits	3
Category	Elective
Required	No
Course Description	A student can qualify for this course only upon completion of all the program competencies, attendance at or above 90%, and completion of the WIT exit assessment. A student will apply knowledge and skills at an employer's work site.