

Fred W. Eberle Technical Center

Diesel Equipment Technology

SYLLABUS

INSTRUCTOR:

ROBERT JOHNSON

1751 Fundamentals of Diesel Tech
1741 Diesel Engine Components
1747 Diesel Support Systems
1749 Diesel Truck Chassis Concepts
1745 Diesel Preventative Maintenance
1743 Diesel Engine Tune-Up &
troubleshooting
1742 Diesel Electrical Systems
1744 Electronic Engine Controls

1751 Fundamentals of Diesel Equipment Technology

This course introduces the student to the knowledge base and technical skills for all courses in the fundamentals of diesel equipment technology concentration. Areas of study include personal and shop safety, career opportunities in the diesel technology industry, the proper use of hand and power tools, and basic oxyacetylene cutting and electric welding and basic shop etiquette. Emphasis will be placed on career exploration, job seeking skills, and personal and professional ethics. Safety instruction is integrated into all activities. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts and teachers should provide each student with real world learning opportunities and instruction related to diesel equipment technology occupations. Students are encouraged to become active members of SkillsUSA for additional co-curricular opportunities that enhance student achievement, develop student leadership, and support experiential learning. Course components also address the 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and content standards and objectives.

Upon completion of the course the students will be able to:

1. Identify, explore, and evaluate careers related to Diesel Technology.
2. Demonstrate knowledge of basic safety rules and equipment as it relates to the Diesel Technology.
3. Identify basic hand tools and their proper use.

4. Demonstrate knowledge of fasteners.
5. Use of basic diesel test equipment, and tools
6. Understand the principle of the two-stroke and four-stroke engine operation.
7. Demonstrate knowledge of diesel fuel, lubricants, and coolants.

1743 Diesel Engine Tune-up

This course introduces the student to the knowledge base and technical skills for all courses in the Diesel engine tune-up and troubleshooting concentration. Areas of study include engine problems and testing, tune-up and adjusting, troubleshooting, and student organizations. Emphasis will be placed on career exploration, job seeking skills, and personal and professional ethics. Safety instruction is integrated into all activities. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts and teachers should provide each student with real world learning opportunities and instruction related to diesel equipment tune-up and diagnostics. Students are encouraged to become active members of SkillsUSA for additional co-curricular opportunities that enhance student achievement, develop student leadership, and support experiential learning. Course components also address the 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and content standards and objectives.

Upon completion of the course the students will be able to:

1. Diagnose diesel engine problems
2. Demonstrate knowledge of tune-up and adjustments of a diesel engine.
3. Perform diagnostic and troubleshooting techniques on a diesel engine.

1741 Diesel Engine Components

This course introduces the student to the knowledge base and technical skills for the diesel engine components concentration. Areas of study include basic engine components, primary functions, service, inspection, and assembly procedures. Safety instruction is integrated into all activities. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts and teachers should provide each student with real world learning opportunities and instruction related to diesel equipment technology occupations. Students are encouraged to become active members of SkillsUSA for additional co-curricular opportunities that enhance student achievement, develop student leadership, and support experiential learning. Course components also address the 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and content standards and objectives.

Upon completion of the course the students will be able to::

1. Develop knowledge of cylinder head components.
2. Demonstrate knowledge of piston and connecting rod assemblies.
3. Acquire knowledge of timing gears and associated components.
4. Demonstrate an understanding of cylinder blocks.
5. Display knowledge of crankshafts.
6. Demonstrate knowledge of bearings and seals.

1747 Diesel Support Systems

This course introduces the student to the knowledge base and technical skills for all courses in the fundamentals of diesel support systems concentration. Areas of study include lubricating and cooling systems, air intake and exhaust systems, starting and charging systems, engine retarders, fuel systems, and governor operation. Emphasis will be placed on career exploration, job seeking skills, and personal and professional ethics. Safety instruction is integrated into all activities. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts and teachers should provide each student with real world learning opportunities and instruction related to diesel equipment technology occupations. Students are encouraged to become active members of SkillsUSA for additional co-curricular opportunities that enhance student achievement, develop student leadership, and support experiential learning. Course components also address the 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and content standards and objectives.

Upon completion of the course the students will be able to:

1. Acquire knowledge of lubrication and cooling systems.
2. Understand the importance of air intake and exhaust systems.
3. Develop knowledge of starting and charging systems.
4. Demonstrate knowledge of engine retarders.
5. Explain the purpose of fuel system components.

1749 Truck Chassis Concepts

This course introduces the student to the base knowledge and technical skills related to heavy truck chassis concepts used in diesel equipment technology. Areas of study include transmissions, clutches, suspension, steering, and air brakes. Emphasis will be placed on operating theory, removal and installation of major

components, and service and inspection procedures. Safety instruction is integrated into all activities. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts and teachers should provide each student with real world learning opportunities and instruction related to diesel engine equipment occupations. Students are encouraged to become active members of SkillsUSA for additional co-curricular opportunities that enhance student achievement, develop student leadership, and support experiential learning. Course components also address the 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and content standards and objectives

Upon completion of the course the students will be able to:

1. Develop knowledge of transmissions, clutches, and drive lines.
2. Develop knowledge of steering, suspensions, tires and wheels.
3. Understand the operation of air brake systems.

1745 Diesel Preventive Maintenance and Inspection

This course introduces the student to the knowledge base and technical skills for all courses in the diesel preventative maintenance and inspection concentration. Areas of study include engine system maintenance, under hood and cab maintenance, electrical/electronic systems, frame and chassis maintenance, and student organizations. Emphasis will be placed on career exploration, job seeking skills, and personal and professional ethics. Safety instruction is integrated into all activities. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts and teachers should provide each student with real world learning opportunities and instruction related to diesel equipment technology occupations. Students are encouraged to become active members of SkillsUSA for additional co-curricular opportunities that enhance student achievement, develop student leadership, and support experiential learning. Course components also address the 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and content standards and objectives.

Upon completion of the course the students will be able to:

1. Demonstrate knowledge of engine systems maintenance.
2. Perform under hood and cab maintenance
3. Perform inspection of electrical/electronic systems.
4. Perform inspections of frame and chassis systems.

1742 Diesel Electrical Systems

This course introduces the student to the knowledge base and technical skills for all courses in the diesel electrical systems concentration. Areas of study include basic heavy-truck electrical theory, engine and truck wiring circuits, storage batteries, diesel electrical system testing, and student organizations. Emphasis will be placed on career exploration, job seeking skills, and personal and professional ethics. Safety instruction is integrated into all activities. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts and teachers should provide each student with real world learning opportunities and instruction related to diesel equipment technology occupations. Students are encouraged to become active members of SkillsUSA for additional co-curricular opportunities that enhance student achievement, develop student leadership, and support experiential learning. Course components also address the 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and content standards and objectives.

Upon completion of the course the students will be able to:

1. Demonstrate Knowledge of Electron Theory.
2. Demonstrate knowledge of Diesel Engine and heavy truck wiring circuits.
3. Understand the importance of storage batteries and diesel charging systems.

1744 Electronic Engine Controls

This course introduces the student to the knowledge base and technical skills for all courses in the diesel electronic engine controls concentration. Areas of study include electronic control modules, electronic fuel injection, and electronic control test equipment. Emphasis will be placed on career exploration, job seeking skills, and personal and professional ethics. Safety instruction is integrated into all activities. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts and teachers should provide each student with real world learning opportunities and instruction related to diesel equipment technology occupations. Students are encouraged to become active members of SkillsUSA for additional co-curricular opportunities that enhance student achievement, develop student leadership, and support experiential learning. Course components also address the 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and content standards and objectives.

Upon completion of the course the students will be able to:

1. Demonstrate an understanding of Electronic Engine Controls.
2. Understand the operation of Electronic Fuel Injectors
3. Demonstrate the proper operation of Electronic Control Test Equipment

Grading Scale:

A = 93-100%

B = 85-92%

C = 76-84%

D = 65-75%

F = Below or less than 64%

CURRICULUM

Curriculum used is governed by:

1. Content standards and objectives provide by the WV department of education. Objectives are located at careertch.k12.wv.us
2. Industry standards. Goals are located at www.natef.com
3. West Virginia standards for 21st century learning. Standards located at careertech.k12.wv.us

TEXTBOOKS:

Medium and Heavy Duty Truck Engine, Fuel, and Computerized Management Systems
Medium and Heavy Duty Truck Engine, Fuel, and Computerized Management Systems
CDX online training

Supplemental manuals and service literature

Students will have homework assignments from the textbook and workbook.

EVALUATION:

Student's final grade will be assessed using daily shop and class grades. Shop grades are based on performance with hands-on task in the shop area. Class grades are based upon workbook, tests, quizzes, classroom participation, attendance and homework. Shop grades make up 60% of the final grade, while class grades make up 40% of the final grade. Sufficient time is offered to all students for doing the work as well as homework assignments.

This program is certified by the National Automotive Technicians Education Foundation (NATEF), in five areas. NATEF curriculum will be injected into the program content as necessary to maintain certification