

**Mecosta - Osceola Career Center**  
**Diesel Technology**  
**Course Syllabus**  
**2022-2023**

**Instructors**

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**Program Goals**

Theory instruction and hands-on performance of all basic tasks will provide initial training for entry-level employment in the medium/heavy truck service field or prepare the student for further training.

**CIP Code**

47.0613

**Course Description**

The Diesel Technology program at MOCC is certified by ASE Education Foundation in three areas of medium/heavy truck technician; diesel engines, preventative maintenance and inspection, and electrical/electronic systems. The program is moving into a new model which allows the students to have training for entry-level employment in the medium/heavy truck service field or prepare students for further training. Inspection, Maintenance, and Minor Repair (IMMR) will include entry-level tasks for eight (8) ASE medium/heavy truck areas, they include: Diesel Engines, Drive Train, Brakes- Air & Hydraulic, Suspension & Steering, Electrical/Electronics, HVAC, Cab, and Hydraulics. The program is two years in length and provides students training through lecture, demonstrations, class work, and lab activities. One year of the program emphasizes diesel engine repair, drive train, HVAC, and cab, while the other year focuses on electrical/electronics, brakes, hydraulics, and suspension & steering. Both years will cover safety, tools & equipment, and employability skills.

Students will be given the opportunity to take the State of Michigan Mechanic Certification tests in diesel engine and electrical systems (free to students).

The course is designed to meet all ASE Education Foundation standards and therefore will cover the tasks identified by ASE Education Foundation, including applied math, science and communication activities.

**Requirements**

- Uniforms: Provided by MOCC- Shirts tucked in and/or buttons buttoned as appropriate.
- Pants: Jeans or work pants are acceptable. No sweatpants, yoga pants, or any pants that have excessive rips or tears in them.

- Safety Glasses: One pair will be provided by MOCC and will be worn in the lab area or other areas as specified.
- Footwear: Safe and appropriate footwear, for example, work boots. Footwear should be closed toed and preferably made of leather.

### **Course Objectives (IMMR 540 Hours)**

#### **Diesel Engines:**

- General inspection, diagnosis, and repair.
- Cylinder head and valve train inspection, diagnosis, and repair.
- Engine block inspection, diagnosis, and repair.
- Lubrication system inspection, diagnosis, and repair.
- Cooling system inspection, diagnosis, and repair.
- Air induction and exhaust inspection, diagnosis, and repair.
- Fuel supply system inspection, diagnosis, and repair.
- Engine brake inspection, diagnosis, and repair.

#### **Drive Train:**

- General inspection, diagnosis and repair
- Clutch inspection, diagnosis and repair
- Transmission inspection, diagnosis and repair
- Driveshaft and Universal Joints inspection, diagnosis and repair
- Drive Axles inspection, diagnosis and repair

#### **Brakes:**

- General inspection, diagnosis and repair
- Air Brakes: Air Supply and Service Systems inspection, diagnosis and repair
- Air Brakes: Mechanical/Foundation Brake Systems inspection, diagnosis and repair
- Air Brakes: Parking System inspection, diagnosis and repair
- Hydraulic Brakes: Hydraulic System inspection, diagnosis and repair
- Hydraulic Brakes: Parking Brake System inspection, diagnosis and repair
- Power Assist Systems inspection, diagnosis and repair
- Vehicle Dynamic Brake System inspection, diagnosis and repair
- Wheel Bearings inspection, diagnosis and repair

#### **Suspension and Steering:**

- General inspection, diagnosis and repair
- Steering Column inspection, diagnosis and repair
- Steering Pump and Gear Units inspection, diagnosis and repair
- Steering Linkage inspection, diagnosis and repair
- Suspension Systems inspection, diagnosis and repair
- Wheel Alignment inspection, diagnosis and repair
- Wheels and Tires inspection, diagnosis and repair
- Frame and Coupling Devices inspection, diagnosis and repair

#### **Electrical/Electronics Systems:**

- General inspection, diagnosis and repair
- Battery Systems inspection, diagnosis and repair

- Starting Systems inspection, diagnosis and repair
- Charging Systems inspection, diagnosis and repair
- Lighting Systems inspection, diagnosis and repair
- Instrument Cluster and Driver Information Systems inspection, diagnosis and repair

#### Heating, Ventilation, and Air Conditioning (HVAC):

- General inspection, diagnosis and repair
- Refrigeration System Components inspection, diagnosis and repair
- Heating, Ventilation, and Engine Cooling Systems inspection, diagnosis and repair
- Operating Systems and Related Controls inspection, diagnosis and repair

#### Cab:

- General inspection, diagnosis and repair
- Instrument and Controls inspection, diagnosis and repair
- Safety Equipment inspection, diagnosis and repair
- Hardware inspection, diagnosis and repair

#### Hydraulics:

- General inspection, diagnosis and repair

#### Employability Skills

##### Safety

##### Hand/Power tools & Fasteners

### Course Requirements

In order to assure the student a "reasonable probability of success" in this program of study it is highly recommended that the student possess a level of academic skills and attitudes that will result in successful completion of the program. If you feel that you may need help with any of the items listed below let one of the instructors know (confidentially, of course). Help may be available.

- Good reading and comprehension skills
- Good general math skills
- Good communication skills - the ability to write a *complete* sentence
- The ability and desire to learn
- A positive attitude
- Good work ethics
- A good attendance record
- Critical Thinking and Problem-Solving Skills

### Grading Procedures & Components

Seventy percent of your grade is composed of class work, lab activities, and career exploration (if applicable). The weight of each in the final assessment depends upon the term being assessed. The remaining thirty - percent is based upon your career readiness. All are explained in greater detail below.

**Class Work** may include any or all of the following:

- \* Career interview
- \* Tests
- \* Quizzes
- \* Applied math & science
- \* Resume
- \* Job application
- \* Career timeline

**Lab Work** may include any or all of the following:

- Demonstrations
- Lab assignments
- Performance tests
- Service floor - a subjective assessment based on your overall performance in the shop as observed by the diesel instructor and Para-educator

**Career Readiness** is composed of three components:

- **Personal Management**
  - Attendance
  - Respect and Ethics
  - Organization
  - Productivity
  - Appearance
  - Stewardship
- **Problem Solving**
  - Perseverance
  - Critical Thinking
  - Technology, Creativity, and Innovation
  - Research, Academic, and Technical Skills
- **Teamwork**
  - Participation
  - Emotional Intelligence
  - Communication
  - Leadership

**Note:** Career Readiness and how it affects your grade will be covered in much greater detail later in the syllabus.

### **Weekly Time Card**

Each week you will turn in a time card (yes, you will punch in and out of class each day. Just like a job!). The time card will fall under the Career Readiness portion of your grade (30%). The weekly score will vary. The score is dependent upon:

- Part 1 & 2 of Daily Question (Google Classroom)

- -15 points for No Call No Show
- -2 points No uniform or inappropriate clothing
- -2 points Tardy
- -1 point no safety glasses
- -1 point OR +1 point for Career Readiness components (Personal Management, Problem Solving, Teamwork)

### Grading Scale:

A 100%-93%	C+ 79.99%-77%	D- 62.99%-60%
A- 92.99%-90%	C 76.99%-73%	F 59.99%-0%
B+ 89.99%-87%	C- 72.99%-70%	I 0%-0%
B 86.99%-83%	D+ 69.99%-67%	
B- 82.99%-80%	D 66.99%-63%	

### Textbooks

Electude (online textbook/simulator) <https://mimoisd.electude.com/>

Fundamentals of Medium/Heavy Duty Commercial Vehicle Systems by Owen C. Duffy and Gus Wright. Copyright 2016 by Jones & Bartlett, LLC, an Ascend Learning Company.

Fundamentals of Medium/Heavy Duty Commercial Vehicle Systems Student Workbook by Owen C. Duffy and Gus Wright. Copyright 2016 by Jones & Bartlett, LLC, an Ascend Learning Company.

Fundamentals of Medium/Heavy Duty Diesel Engines by Gus Wright. Copyright 2017 by Jones & Bartlett, LLC, an Ascend Learning Company.

Fundamentals of Medium/Heavy Duty Diesel Engines Student Workbook by Gus Wright. Copyright 2017 by Jones & Bartlett, LLC, an Ascend Learning Company.

### Articulation

MOCC Diesel Technology currently has an articulation agreement with a number of post-secondary institutions. This means you can earn not only high school credit for completing this course, but you can also earn **college credit** at participating colleges and technical colleges!

### Tools & Clothing

**Tools** will be provided by MOCC. You will however, be responsible for those tools. If you break a tool let us know so we can replace or repair the tool. We understand tools can be broken. You're learning and you are going to make a mistake, that's how you learn! If you break a tool deliberately or lose a tool that you were responsible for you will be held liable for its repair or replacement. You are encouraged to provide your own set of tools. Tools are a good investment (if you take care of them), and you will need to have your own tools if you are

planning on a career in this field anyway. Why not start early and add to your investment slowly? Then, when you're out of school and secure that job as a technician, you'll be ready to go!

**Safety glasses** will be provided, and must be worn at all times in the shop. However, you can provide your own if you wish. If you lose your safety glasses, **YOU** are responsible for replacing them; a pair can be purchased at the main office. Students will **NOT** be allowed in lab without glasses on!

Each student will be provided with a uniform shirt, locker, and a lock. You are encouraged to bring **clothes** to work in (coveralls or overalls) and a pair of work boots or shoes. You will not do any work in the shop if you are wearing any type of open toed shoes, (sandals & flip-flops), or shorts. Not working in the shop because you don't want to get your clothes dirty *will not* be an option! Wear, or bring, clothes you can work in.

## **Class Operation & Procedures**

First, there will be an introduction and discussion to new material and concepts. Next, there will be a demonstration on procedures and practices. And finally you will have the opportunity to practice the procedure.

The first part will involve a lecture, along with a pre-test. The second will have you watching a demonstration. The third will have you performing the job yourself.

The class will go on if you choose not to show up. Some lab assignments may be made up upon your return after an absence if it does not interfere with the day's activity. Class work will be made up on your time.

The **curriculum**, which is based on NATEF recommendations and guidelines, is the areas of medium/heavy duty repair that you are going to study.

Each repair area is divided into **duties**, or **units**.

Each duty, or unit, is then divided into **tasks**. Tasks are the assignments, both paper/pencil and lab, that you will be responsible for. Also, most tasks are sequential which means that one task should be completed before another.

Each lab assignment must first be performed on a school owned vehicle before a student will be allowed to perform the task on a "live vehicle". A **live vehicle** will be considered to be a vehicle that is titled, licensed, insured, and going down the road after the repair.

## **Make-up Policy**

**Class work** (Google Classroom assignment, paper/pencil assignments) can be made up after an absence on your own time. Other arrangements will be made for quizzes and tests if the absence was legitimate. See attendance policy.

Some **lab assignments** may be made up upon your return after an absence if it does not interfere with the day's activity and/or the shop is still set-up for you to perform the lab assignment. Demonstrations *cannot* be made up. If a procedure is demonstrated to the class on Tuesday and you're absent we are not going to put the class on hold Wednesday just to get you caught up, (time is precious!). If the absence is school related you will not lose points, if it is *not* school related it will cost you! It is important for you to be here!



## **Student Vehicles**

Students typically **will not** be allowed to bring in their own vehicles during class time. We have tried to accommodate students that have experienced car problems on the way to school or needed to make repairs in the past and found that it causes nothing but problems. It is very easy to forget that this is **NOT** an automotive repair facility, it is a school. If we allow what pulls up to the door to dictate what we are going to be doing for the day we are no longer a school, we are a hobby shop where kids come to tinker with their cars. While this would certainly make teaching this class a lot easier it would be a disservice to the student and the taxpayers. You are here to study heavy duty systems and how to perform **quality** diagnosis and repairs.

The only way you can get your vehicle into this shop is if the repair you want to make fits in with what we are studying. For example, you won't be allowed to bring your vehicle in to replace the water pump if we are studying drum brakes. Also, as stated above, you must have completed the repair on a school vehicle before performing the repair on a live vehicle. When the day arrives for the repair you will hand your keys to Mr. Bird and get them back when the repairs are completed and any charges are paid for. You must also be aware that the repair may take more than one class period and if the instructors notice anything that's not safe about the vehicle you may not be allowed to drive it out of the shop. It may have to leave on a hook.

## **Career Readiness**

### **Introduction**

The career readiness program was developed by members of the teaching staff at MOCC and is used in all programs. Although it is school policy that career readiness accounts for 30% of your grade, each teacher has a different interpretation of the work ethic terminology, and therefore, a different approach to determining your career readiness grade. This section of the syllabus will describe how the work ethic program is applied to the diesel technology program.

### **Career Readiness Rating Scale**

Daily participation scores are based on the following components:

- Attendance
- Respect and Ethics
- Organization
- Productivity
- Appearance
- Stewardship
- Perseverance
- Critical Thinking
- Technology, Creativity and Innovation
- Research, academic and technical skills
- Participation
- Emotional Intelligence
- Communication
- Leadership

## **Personal Management & Attendance Policy**

The "Personal Management" category is where attendance, punctuality, and safety are listed and therefore, a greater emphasis is placed on these behaviors. (Please note that this is the Diesel Technology attendance policy. For information on the Mecosta-Osceola Career Center's attendance policy, refer to the student handbook).

Attendance is a **MUST**! You have to be here to complete the program, activities and work will **NOT** stop just because you aren't here! If you are going to be absent, you **MUST** call in! This is **MANDATORY**!

### **Absent**

Each week you will earn participation points, 10 points a day towards your career readiness grade. These points are earned/lost through your work ethic, uniform and attendance. The following statements/questions will explain the Diesel Technology attendance policy:

#### **What does it mean to have good attendance?**

Attendance is the act or fact of attending (being present at) school/work. Good Attendance affects the success of each individual and is very important. Any student or employee is expected to attend class or work. Your success is directly related to your attendance and punctuality in every aspect of your life.

#### **What is considered good attendance?**

Regular and punctual attendance is essential for effective learning, promoting positive relationships and developing good attitudes to education. Good attendance is considered above 95%, or approximately no more than one day of absence each half term. (12 days a school year to put in perspective)

### **Tardy**

A tardy is defined as not being in your seat at the start of class. For example, if you are not in your seat at 8:30 a.m., 12:40pm and attendance is taken, you are tardy; being in the lab does not count as being at "class" on time. After 3 Tardies will be the same as 1 missed day in class, and will be added towards your 3 days absent for the -100 points.

Being late at work would eventually cost you your job! Your Career Readiness grade will be affected. If you are late or absent it is very unlikely you will pass this class and may eventually be dropped from the program.

### **Signing Out**

If you need to sign out, you must fill out a "sign-out permission slip". It will make things a lot easier if you bring a note from your parent or a phone number where they can be contacted (MOCC school policy). If you are 18 years of age, you must have a filled out "Age of Majority" form on file!



### **Left Classroom/Shop**

If you are "missing in action" and someone has to go looking for you, you will lose **all** of your career readiness points for the day. Other consequences may also apply.

### **Safety**

Every item under the safety category is of major importance. If you display any of the behaviors listed, you will be written up promptly and your parent(s)/guardian(s) will be contacted. If the problem becomes persistent you might not be allowed in the shop and you could be removed from the program.

### **Cell Phones**

Cell phones are helpful tools when used properly. Cell phones will NOT be out/used/looked at during class or lab time unless instructor authorized. If the instructor has to ask you more than once for the phone to be put away, a parent will have to pick the phone up during office hours.

### **Comes Prepared to Work**

You will lose points if you didn't bring something to class that you were responsible for. No writing utensil, left your work boots home, didn't bring an assignment that was due, anything that was your responsibility that causes an inconvenience, or disruption to the class is fair game. ***You will lose ALL of your Career Readiness points for the day if you show up to class wearing shorts and/or open toed shoes and you have nothing in your locker to change into!***

**\* Disclaimer: The Diesel Technology syllabus is subject to change. The instructor will notify the Students of any changes in a writing.**

**\*\*Accommodations: Accommodations will be made for Students to the best of our ability. Examples of accommodations are: tests read to you, extended time for tests, modified test, etc.**

Notice of Nondiscrimination In compliance with Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, the Americans with Disabilities Act of 1990, and the State of Michigan's Elliott-Larsen Civil Rights Act of 1977, Section 102(a) it is the policy of the Mecosta-Osceola Intermediate School District that no person shall, on the basis of race, color, religion, national origin or ancestry, gender, age, disability, height, weight, or marital status be excluded from participation in, be denied the benefits of, or be subjected to discrimination during any program or activity or in employment. In addition, arrangements can be made to ensure that the lack of English language skills is not a barrier to admission or participation. Inquiries regarding this policy should be directed to: Superintendent or superintendent designee, Mecosta-Osceola Intermediate School District, 15760 190th Avenue, Big Rapids, MI 49307, Telephone (231) 796-3543.

## Syllabus Acknowledgement

Diesel Technology students reviewed the syllabus together. Syllabus is available on Google Classroom (Class code: wjjicjn). If you would like a hard copy of the syllabus, please notify Mrs. King. By signing and returning this portion of the syllabus, the student agrees that they have received, read, and understand the above statements.

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Parent/Guardian Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Best phone # to reach **parent**

\_\_\_\_\_  
Best time to contact parent

\_\_\_\_\_  
Parent/Guardian email (for class information and upcoming news)  
PLEASE PRINT CLEARLY!

If you would like to be added to our notification system, please send a text to 81010. Text this message: @8b3k7f9

Would you like to receive the Diesel Tech newsletter (email)?    YES                      NO

Do you have internet access?    YES                      NO