# Course Syllabus

## Course Title
Diesel Engine Troubleshooting Procedures

## Course Number
MTE-2058C

## Prerequisites
MTE 1001C, MTE1042C, MTE 2160C

## Credit Hours
3.0

## Contact Hours
60

## Class Meeting Times
May 13 – Jun 22 Tue. & Thr. 1:00pm-6:00pm in Marine 1614

## Class Method
This course blends traditional face-to-face and online learning. Students are expected to attend classroom sessions on (dates and times) as well as participate in online activities as assigned.

## Instructor
Capt. John DeMeo  
John.demeo@fkcc.edu  
Office # 1613  
Office Phone # 305-809-3209

## Office Hours
Mon 11:00am-1:00pm/7:00pm-8:00pm  
Tues 12:30pm-1:00pm/6:00pm-7:00pm  
Wed 12:30pm-1:00pm/7:00pm-9:00pm  
Thur 10:00am-1:00pm

## Course Description
Designed to give the student an understanding of the value of proper diagnosis and fault codes. Also the factory approved procedures for diagnosis and operation of components; an emphasis on the ability to recognize and identify gear and bearing failures, and to name the cause of the failure. Additionally the ability to distinguish between harmless faults and those that indicate an initial stage of failure; there will also be some troubleshooting with the aid of hand held diagnostic tools and laptops. Use of factory service manuals and special tools will be emphasized.
COURSE OBJECTIVES

1. DEMONSTRATE THE USE OF PROPER PERSONAL PROTECTIVE EQUIPMENT (PPE)
2. DESCRIBE THE HISTORY OF A MODERN DIESEL ENGINES ENGINE.
3. DEVELOP AN UNDERSTANDING OF THE THEORY OF OPERATION USED FOR DIESEL ENGINES
4. OPERATE ALL GENERAL TOOLS USED IN THE MARINE ENGINEERING DEPARTMENT
5. STUDENT DEMONSTRATES THE ABILITY TO READ MFG. SERVICE MANUALS
6. STUDENTS DEMONSTRATE PROPER MAINTENANCE TECHNIQUES.
7. STUDENT DEMONSTRATES THE ABILITY TO READ MFG. SERVICE MANUALS.
8. STUDENT IS ABLE TO DEMONSTRATE PROPER DISASSEMBLY TECHNIQUES
9. STUDENT DEVELOPS A COMPREHENSIVE MATERIALS LIST. 1. DEMONSTRATING AN UNDERSTANDING OF DIESEL ENGINE TROUBLESHOOTING
10. STUDENTS DEMONSTRATE THE ABILITY TO SERVICE A DIESEL CYLINDER HEAD.
11. STUDENTS DEMONSTRATE SKILLS NECESSARY FOR ENGINE REASSEMBLY.
12. STUDENTS DEVELOP THE HABIT OF REVIEWING AND USING SERVICE MANUALS TO PROPERLY CONDUCT WORK.
13. STUDENTS DEMONSTRATE SKILLS NECESSARY FOR ENGINE REASSEMBLY.
14. STUDENTS DEVELOP THE HABIT OF REVIEWING AND USING SERVICE MANUALS TO PROPERLY CONDUCT WORK.
15. STUDENTS DEMONSTRATE A BASIC UNDERSTANDING OF TROUBLESHOOTING TECHNIQUES.
16. DEMONSTRATING AN UNDERSTANDING OF DIESEL ENGINE SYSTEMATIC TROUBLESHOOTING.

REQUIRED TEXTBOOK

Marine Diesel Engines, 3rd Edition
International Marine/Ragged Mountain
Nigel Calder
**PROPOSED COURSE SCHEDULE**

Please note: The course schedule is subject to change to meet the needs of the course and its students. If you miss a class, it is YOUR responsibility to stay current.

<table>
<thead>
<tr>
<th>Module 1</th>
<th>Textbook Chapters--Topics</th>
<th>Assignments-- Points</th>
</tr>
</thead>
</table>
| **Introduction Lab Safety** | Instructor Information  
Student Introductions  
Class Expectations  
D2L Review  
Shop Orientation | Read Chapter 1 |
| Module 2 | **Theory of Diesel Engines**  
History of Diesel Engines  
Develop an understanding of the theory of operation used for diesel engines  
Operate all general tools used in the Marine Engineering Department | Observe students properly select and don PPE for an instructor specified task.  
Read Chapter 2 |
| Module 3 | **Cleanliness and Troubleshooting Part 1**  
Student demonstrates the ability to read MFG. service manuals  
PowerPoint — Troubleshooting Quiz | Read Chapter 3  
Troubleshooting Lab 1 |
| Module 4 | **Troubleshooting Part 2**  
PowerPoint — Troubleshooting Quiz | Read Chapter 4  
Troubleshooting Lab 2 |
| Module 5 | Maintenance and Repair Procedures Part 1 | Students demonstrate proper maintenance techniques.  
PowerPoint — Maintenance and Repair  
Quiz | Read Chapter 5  
Troubleshooting Lab 3 |
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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Module 6</td>
<td>Mid-Term</td>
<td>Demonstrating an understanding of diesel engine troubleshooting</td>
<td></td>
</tr>
<tr>
<td>Module 7</td>
<td>Maintenance and Repair Procedures Part 2</td>
<td>Student is able to demonstrate proper disassembly techniques</td>
<td>Troubleshooting Lab 4</td>
</tr>
</tbody>
</table>
| Module 8 | Engine Selection. | Students demonstrate the ability to service a diesel cylinder head  
Quiz |  |
<table>
<thead>
<tr>
<th>Module 9</th>
<th>PMS and Troubleshooting</th>
<th>Students demonstrate a basic understanding of troubleshooting techniques.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Students test engines and troubleshoot starting problems.</td>
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<tr>
<td></td>
<td>Observation of students conducting test on operational engines.</td>
<td></td>
</tr>
<tr>
<td>Module 10</td>
<td>Final Exam</td>
<td>Demonstrating an understanding of diesel engine systematic troubleshooting</td>
</tr>
<tr>
<td>Module 11</td>
<td>Review and Clean-up</td>
<td>Lab Clean-up.</td>
</tr>
</tbody>
</table>

**STUDENT EVALUATION AND COURSE POLICIES**

<table>
<thead>
<tr>
<th>STUDENT GRADE DETERMINATION</th>
<th>FKCC GRADING SCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>15% Attendance – 25 Points Each – Total 300</td>
<td>1600-2000 A</td>
</tr>
<tr>
<td>10% Troubleshooting Labs – 50 Points Each – Total 200</td>
<td>1200 - 1599 B</td>
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<tr>
<td>20% Quizzes – 100 Points Each – Total 400</td>
<td>800 - 1199 C</td>
</tr>
<tr>
<td>40% Final Exam – 800 Points</td>
<td>400 - 799 D</td>
</tr>
<tr>
<td>15% Homework – 50 Points Each – Total 300</td>
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Class Policies

Exam Policy

- Students will be allowed 1 page of hand written or typed notes.
- Students missing the exam without an “Excused Absence” will receive a failing grade for the class. No exceptions. (See below for a list of Excusable Absences)
- No cellphones. All cellphones must be turned off during testing periods. If there is an emergency or some other reason in which it is necessary to be left on, the student will notify the professor prior to the class with the reason. The professor reserves the right to withhold the test from any student refusing to turn off a cell phone for any reason. In this circumstance students will not be given a makeup exam.

Excused Absences

Life is filled with challenges and obstacles that we all must overcome. This program is a challenge too which you have voluntarily committed yourself. This class should be a priority and you should not be scheduling activities during the time periods this class meet. That being said, I do understand that emergencies come up from time to time. You must understand that I have heard every excuse for missing classes from my dog died all the way too I got called to the White House! Below I have listed several instances in which an absence will be excused.

- A death in the immediate family:
  Immediate means; parent, spouse, child, grandparent, or sibling. You must provide documentation of the loss in the form of; an obituary from a newspaper with a current date, or a signed and dated letter from a mortuary stating the relationship between you and the deceased. I do understand that any loss of life can devastating, this is however the only instance of a loss of life that will allow excuse from this class.

- Illness:
  An illness serious enough to miss class with an excused absence is serious enough to require a trip to the doctor’s office. Students out sick from class will provide a letter of excuse from a medical doctor stating, “In my medical opinion, (Your name) should be excused from class on (the date of class or classes to be missed) due to the severity of their illness.” This letter should be signed, dated, and written on the doctor’s office letterhead. If this documentation is not provided in the manner which you see above the absence will not be excused.

- Military Orders:
  A student on military orders MUST provide a copy of the orders to the professor.

- College Error:
  If I make a mistake, or the college has created some action that prevents you from attending class can be documented you, the student, will not be penalized.

Above are the only absences that will be excused. You should also understand that an excused absence does not mean that you are awarded points for attendance, tests, or homework. An excused absence shall only allow you to turn in any work that was due on that day for no penalty.
Reading Assignments and Homework

- All reading assignments and homework shall be done outside of class time.

Attendance

- I will strictly monitor student attendance and participation during each class session.
- Students who do not regularly participate in class are considered absent from the class.
- An instructor may withdraw a student from courses for excessive absences and/or non-attendance up to the 70% point in the semester.

Class Participation

In order to receive full points for class participation students must actively work during labs in a clean and organized manner. Students working in groups must SHARE the workload. All work should be completed properly and thoroughly.

- Other key points:
- These participation points are the easiest part of your grade to earn, and also the easiest to forget to do. Don't forget!
- Students earn points for each class they attend and participate in. Arriving late, leaving early, cell phone and non-class computer usage, as well as any other disruption of class will result in loss of points.

Communication:

All class e-mail communications should be conducted using your FKCC student email address. The prime responsibility for timely communications rests with you - the student.

Important Note: If I have not responded to your email or voicemail message by the end of the day after you left the message, you should assume that I did not receive it and leave another message.

Academic Honesty & Plagiarism

- Students are expected to respect and uphold the standards of honesty in submitting written work to instructors. Though occurring in many forms, plagiarism in essence involves the presentation of another person’s work as if it were the work of the presenter.
- Any cheating or plagiarism will result in disciplinary action to be determined by the instructor based on the severity and nature of the offense. It is the student’s responsibility to review the College’s policy on Academic Honesty.
Special Needs

- If you have any special needs or requirements pertaining to this course, please discuss them with the instructor early in the term.
- If you have special needs as addressed by the Americans with Disabilities Act (ADA) and need assistance, please notify the Office for Students with Disabilities at 305-809-3292 via email at: karla.malsheimer@fkcc.edu or the course instructor immediately.
- Reasonable efforts will be made to accommodate your special needs.

Mandatory Required Dress Code:

1. 1 pairs of shatter resistant clear safety glasses.
2. Work Boots or Closed Toed Shoes
3. Coveralls or full Jeans and T-Shirt.
4. Mechanics Gloves (Optional)
5. A cotton baseball cap is recommended for all students, however for students with hair longer than chin length will be REQUIRED to properly keep hair tied back.

Students are not under any circumstances to wear or bring any of the following into the lab area:

1. Materials or clothing such as but not limited to nylon, spandex, polyester, wool, etc.
2. Hair products, cigarette lighters, combustible fluids, makeup or beauty products breathe spray, etc.

Any student found with any of the above products in the shop area will be terminated from the program immediately.

3. Drugs of any kind.
   i. The instructor must be notified of all prescription drugs in the shop.

Students caught in possession of, using, or suspected being under the influence of any mind-altering substance will be grounds for termination from the course immediately.

Students that are not properly dressed will not enter the lab.
Required Tool List:
Students are REQUIRED to have their own tools. Marine Engineering will provide “Specialty” tools to be checked out and returned every day.

- Tool Box or Bag
- Needle Nose Pliers
- 6” Slip joint Pliers
- Wire Cutters (side cutters)
- Pocket Knife 3”
- Combination Wrenches (Standard) 5/16” thru 1 1/8”
- Combination Wrenches (Metric) 8mm thru 17mm
- Allen Wrenches 1/16” thru 3/8”
- Allen Wrenches 5mm thru 10mm
- Ball peen hammer 12 to 14oz.
- Screwdriver set: Phillips #1, #2 and #3
  
  - Standard (flathead) #1, #2 and #3
  
  - (Screwdrivers should be average shank and one stubby each Philips, Flathead) #2

- Socket sets: 3/8” Drive 3/8” thru 13/16” with 6-point configuration (Standard)
  
  - 8mm thru 17mm with 6-point configuration. (Metric)

  NOTE: 12 point-configured sockets are ok if of good quality.

- Extensions for socket set: 3” and 6”
- Ratchet 3/8” drive
- Flexible extension will be handy

**REQUIRED TOOL LIST – SUPPLIMENTAL**

- Test light – 12 volt
- Jumper leads – 14 gauge, 6ft. length
- Flashlight
- ¼” Socket Set (Standard)
- ¼” Socket Set (Metric)
- ¼” Ratchet
- ¼” Extensions – 1”, 3”, 6”
- ¼” flexible extension
- Wire Strippers/crimpers
- Hook Tool – Commonly called a #*&@!” Hook- (for the removal of cotter pins, etc.)
- Assortment of punches – center, roll pin, etc.
- Pry Bar – Approximately 12” is fine
  
  - ½” to 3/8” adapter
  - 3/8” to ¼” adapter
Final Things to Remember:

Though am always excited to have new students, I am always puzzled at the notion “… there are no dumb questions…” This just is not correct. Below I have listed some things you should never ask or discuss with me:

1. What did we do yesterday?
My answer to that question will always and forever be, “I don’t remember…” If you did not attend class my class do not ask me what happened. I went over what was covered on the day you did not attend. I will not go over it again until the next time the class is offered. Please see a classmate for the notes and information you missed.

2. Will this be on the test?
My answer to that question will always and forever be, “I have no idea… I don’t remember what I wrote.” Assume everything that I say, or that you read during the course of this class will be on your exam. In fact, you should go the extra mile and assume that if you ask me that question I may blindside you with the starting line up of the 1956 Boston Red Sox or questions regarding anything and everything within this known universe and beyond.

3. When is (insert name of assignment) due?
My answer to that question will always and forever be, “I have no idea… I don’t remember what I wrote.” All your due dates are on your calendar in D2L. If you do not know how to use D2L go to the library and ask for a D2L tutorial. All other important due dates were explained on day 1 of class and also are provided in the syllabus.

4. Did you get my email yet?
I promise that if I got your email you would have a response within 24 hours. If you did not receive a response within that time, assume I did not receive your email.

5. The reason I did not complete my assignment was…
With all honesty, I do not care why you did not complete your assignment unless it is for one of the “excused absences”. Please do not explain this information to me, as I am not your counselor. Since I will not be helping you with this information I have provided the information for Dr. Phil. I am sure he can help you vent. Dr. Phil Show 5482 Wilshire Boulevard #1902 Los Angeles, CA 90036

Students are expected to familiarize themselves with FKCC Policies, which can be found in the current Student Handbook.
<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Meets Intended Goal</td>
<td>Portfolio contains artifacts of all lab sessions. Artifacts are grouped by lab session. Artifacts accurately depict work accomplished.</td>
<td>Portfolio contains artifacts of all lab sessions. Artifacts are grouped by lab session. Artifacts generally depict work accomplished.</td>
<td>Portfolio contains artifacts of most lab sessions. Artifacts are grouped by lab session. Artifacts generally depict work accomplished.</td>
<td>Portfolio contains a few artifacts, not grouped.</td>
</tr>
<tr>
<td>Participation</td>
<td>Actively participated in project activity, and attended all work sessions.</td>
<td>Actively participated in project activity, and attended 90% of all work sessions.</td>
<td>Actively participated in project activity, and attended at least 70% of all work sessions.</td>
<td>Usually participated in project activity, and attended at least 70% of all work sessions</td>
</tr>
<tr>
<td>Quantity of Artifacts</td>
<td>Minimum of 6 artifacts per lab session.</td>
<td>Minimum of 4 artifacts per lab session.</td>
<td>Minimum of 3 artifacts per lab session.</td>
<td>Minimum of 2 artifacts per lab session.</td>
</tr>
<tr>
<td>Reflection</td>
<td>Reflections cover each artifact. Reflections tell the reader about the lessons learned during projects.</td>
<td>Reflections cover most artifacts. Reflections tell the reader about the lessons learned during projects.</td>
<td>Reflections generally explain the content of the portfolio.</td>
<td>Reflections are offered by the author. But lack relevance to the project.</td>
</tr>
<tr>
<td>Grammar / Spelling</td>
<td>Good use of grammar. No spelling errors.</td>
<td>Generally uses correct grammar. No more than 6 spelling errors.</td>
<td>Poor use of grammar. No more than 10 spelling errors.</td>
<td>Project needs major revision.</td>
</tr>
<tr>
<td>Content</td>
<td>Portfolio captures all of the major steps completed during each lab session. (see student lab work sheet)</td>
<td>Portfolio captures 70% of the major completed during each lab session. (see student lab work sheet)</td>
<td>Portfolio captures 50% of the major completed during each lab session. (see student lab work sheet)</td>
<td>Portfolio captures some of the major completed during each lab session. (see student lab work sheet)</td>
</tr>
<tr>
<td>Pride</td>
<td>Work reflects this student's best efforts.</td>
<td>Work reflects a strong effort from this student.</td>
<td>Work reflects some effort from this student.</td>
<td>Work reflects very little effort on the part of this student.</td>
</tr>
</tbody>
</table>
Collaborative Work Skills: MTE 2234C Gearcase Rubric (For All Labs)

Student Name: __________________________________________

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
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<th>1</th>
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</thead>
<tbody>
<tr>
<td><strong>Project</strong></td>
<td>Project works first time with no rework required. Completed project is clean and neat in appearance with no major defects.</td>
<td>Project requires minor rework prior to successful retest. Completed project is clean and neat in appearance with one or two defects.</td>
<td>Project requires major rework prior to successful retest. Completed project has several major deficiencies, or is unprofessional in appearance.</td>
<td>Project fails to work.</td>
</tr>
<tr>
<td><strong>Preparedness</strong></td>
<td>Brings required tools, course literature and other support materials; and is always ready to work.</td>
<td>Almost always brings required tools, course literature and other support materials; and is always ready to work.</td>
<td>Almost always brings required tools, course literature and other support materials; but sometimes needs to settle down and get to work.</td>
<td>Often forgets required tools, course literature and other support materials; or is rarely ready to get to work.</td>
</tr>
<tr>
<td><strong>Problem-solving</strong></td>
<td>Actively looks for and suggests solutions to problems.</td>
<td>Refines solutions suggested by others.</td>
<td>Does not suggest or refine solutions, but is willing to try out solutions suggested by others.</td>
<td>Does not try to solve problems or help others solve problems. Lets others do the work.</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>Demonstrates awareness of potential safety issues and takes appropriate action to prevent problems. Uses proper PPE for task at hand.</td>
<td>Uses proper Personal Protective Equipment (PPE) for task at hand.</td>
<td>Occasionally requires prompting to use appropriate PPE for the task at hand.</td>
<td>Routinely requires prompting to use appropriate PPE for the task at hand.</td>
</tr>
<tr>
<td><strong>Time-management</strong></td>
<td>Routinely uses time well throughout the project to ensure things get done on time. Group does not have to adjust deadlines or work responsibilities because of this person’s procrastination.</td>
<td>Usually uses time well throughout the project, but may have procrastinated on one thing. Group does not have to adjust deadlines or work responsibilities because of this person’s procrastination.</td>
<td>Tends to procrastinate, but always gets things done by the deadlines. Group does not have to adjust deadlines or work responsibilities because of this person’s procrastination.</td>
<td>Rarely gets things done by the deadlines AND group has to adjust deadlines or work responsibilities because of this person’s inadequate time management.</td>
</tr>
<tr>
<td><strong>Contributions</strong></td>
<td>Routinely provides useful ideas when participating in the group and in classroom discussion. A definite leader who contributes a lot of effort.</td>
<td>Usually provides useful ideas when participating in the group and in classroom discussion. A strong group member who tries hard!</td>
<td>Sometimes provides useful ideas when participating in the group and in classroom discussion. A satisfactory group member who does what is required.</td>
<td>Rarely provides useful ideas when participating in the group and in classroom discussion. May refuse to participate.</td>
</tr>
</tbody>
</table>