



SYLLABUS

ITI Diesel Mechanic Course Syllabus

The ITI Diesel Mechanic course is designed to provide students with the knowledge and skills needed to maintain, repair, and service diesel engines and their components.

COURSE DURATION - 1 YEAR

1st Year Syllabus

Subject 1: Introduction to Engine

- **Unit 1: Basics of Engine**

- **Content:**

- Overview of internal combustion engines
- Differences between diesel and petrol engines
- Basic engine components and their functions
- Engine cycles: Two-stroke and four-stroke

Subject 2: Basic Electricity

- **Unit 1: Fundamentals of Electricity**

- **Content:**

- Basic electrical concepts: Voltage, current, resistance
- Ohm's Law
- Series and parallel circuits
- Use of multimeters and other electrical measuring instruments

Subject 3: Basic Electronics

- **Unit 1: Electronic Components**

- **Content:**

- Introduction to semiconductors
- Types of electronic components: Resistors, capacitors, diodes, transistors
- Basics of digital electronics

Subject 4: Battery

- **Unit 1: Battery Technology**
 - **Content:**
 - Types of batteries used in diesel engines
 - Battery construction and chemistry
 - Battery maintenance and testing
 - Charging and discharging cycles

Subject 5: Welding

- **Unit 1: Welding Basics**
 - **Content:**
 - Introduction to welding techniques: Arc welding, gas welding, MIG/TIG welding
 - Welding safety practices
 - Welding equipment and materials
 - Basic welding joints and positions

Subject 6: Heat Treatment

- **Unit 1: Heat Treatment Processes**
 - **Content:**
 - Basics of heat treatment
 - Types of heat treatment processes: Annealing, hardening, tempering, quenching
 - Applications of heat treatment in engine components

Subject 7: Non-Destructive Testing

- **Unit 1: NDT Techniques**
 - **Content:**
 - Introduction to non-destructive testing (NDT)
 - Common NDT methods: Visual inspection, ultrasonic testing, radiographic testing, magnetic particle testing
 - Applications of NDT in engine maintenance

Subject 8: Fuel System

- **Unit 1: Fuel Supply and Management**
 - **Content:**
 - Components of the fuel system: Fuel tank, fuel pump, fuel injectors
 - Fuel system layout and operation
 - Common fuel system problems and troubleshooting

Subject 9: Fuel Injection

- **Unit 1: Fuel Injection Systems**
 - **Content:**
 - Basics of fuel injection

- Types of fuel injection systems: Mechanical, electronic
 - Operation and maintenance of fuel injectors
 - Fuel injection timing and adjustments
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2nd Year Syllabus

Subject 10: Air Intake System

- **Unit 1: Air Supply Management**
 - **Content:**
 - Components of the air intake system: Air filter, intake manifold, turbocharger
 - Air intake system operation
 - Maintenance of air intake components
 - Importance of clean air supply

Subject 11: Exhaust System

- **Unit 1: Exhaust Management**
 - **Content:**
 - Components of the exhaust system: Exhaust manifold, catalytic converter, muffler
 - Operation of the exhaust system
 - Emission control technologies
 - Maintenance of exhaust components

Subject 12: Charging System

- **Unit 1: Alternators and Charging Circuits**
 - **Content:**
 - Basics of the charging system
 - Components: Alternator, voltage regulator, charging circuits
 - Operation and troubleshooting of the charging system
 - Battery charging and maintenance

Subject 13: Starting System

- **Unit 1: Starting Mechanisms**
 - **Content:**
 - Basics of the starting system
 - Components: Starter motor, solenoid, ignition switch
 - Operation and troubleshooting of the starting system
 - Maintenance of starting system components

Subject 14: Engine Performance Rating

- **Unit 1: Engine Testing and Rating**
 - **Content:**

- Engine performance parameters: Power, torque, efficiency
- Methods of measuring engine performance
- Factors affecting engine performance
- Performance tuning and adjustments

Subject 15: Diesel Engine Principle

- **Unit 1: Diesel Engine Fundamentals**
 - **Content:**
 - Principles of diesel engine operation
 - Differences between diesel and gasoline engines
 - Advantages and disadvantages of diesel engines
 - Applications of diesel engines

Subject 16: Hydraulics and Pneumatics

- **Unit 1: Fluid Power Systems**
 - **Content:**
 - Basics of hydraulics and pneumatics
 - Components of hydraulic and pneumatic systems
 - Operation of hydraulic and pneumatic circuits
 - Maintenance and troubleshooting of fluid power systems

