BAYUBALI ENGINEERING SDN BHD

INTERNAL COMBUSTION ENGINE (ICE) ENGINEERS COURSE

Training Dates:	As per schedule	**Training Venue:**	Kuala Lumpur, Malaysia
Basic Fee:	RM3,450.00 + SST per participant (this includes course materials, meals, refreshment and attendance certificate)		

DURATION

21 hours (Three (3) days)

TARGET GROUP

The course is designed for individuals interested in becoming trained engineers in Internal Combustion Engines (ICE), including new engineers, team leaders/coordinators, operations engineers, maintenance team leaders, engineers, operations team leaders, inspection personnel, and senior operations and maintenance personnel.

TARGETED INDUSTRY/INDUSTRIES

Oil & Gas, Petrochemicals, Power Plant, Renewal Energy Plant, Co-Generation Plant, Palm Oil Mills and Refineries, Plywood Industries, Hotels and all industries that are using Internal Combustion Engines.

CERTIFICATION

This course is suitable for engineers who are willing to be trained as Internal Combustion Engine Engineers, as required by the Department of Occupational Safety and Health, Malaysia (DOSH).

COURSE OBJECTIVE

The program also covers the design, installation, operation, and maintenance of ICE machines, highlighting the characteristic features of various reciprocating piston engine types and gas turbine types, as well as their efficiencies, vulnerabilities, reliability, and operational and maintenance peculiarities.

COURSE OUTCOMES

At the end of the course, delegates will be able to:

- Describe the fundamentals of Internal Combustion Engines (ICE), ICE classification, and engine performance.
- Understand various piston engines, including 2-stroke and 4-stroke engine structures, operations, and timing diagrams, as well as Diesel Compression Ignition engines, Petrol Spark Ignition engines, turbochargers, starting systems, lubrication systems, fuel systems, and cooling systems. Additionally, they will gain knowledge of engine operation and maintenance.

- Understand various gas turbine engines, including their theory, major components and functions, auxiliary equipment, control systems, fire protection and instrumentation systems, as well as gas turbine operation, performance, and maintenance.
- Understand material behaviors in rotating machinery.

TRAINING METHODOLOGY

- Lecture
- Pre- and Post-Test
- Classroom discussions
- Short video presentation
- Case study

COURSE CONTENTS

1. **An Overview of the Occupational Safety and Health Act 1994**

2. **Continuous Cycle Gas Turbine: -**
   - Basic theory of gas turbine systems
   - Gas turbine process
   - Major components and functional description of typical gas turbine power plant (compressor, type of combustor/burner, turbine, and generator)
   - Mounting and fittings
   - Operational procedures (pre-start check, start-up, check during normal operation and emergency)
   - Trouble-shootings

3. **Reciprocating Engines: -**
   - The process of combustion in spark ignition and compression ignition engines
   - The principles underlying the working of Internal Combustion Engines (two stroke and four stroke)
   - Use of Indicator diagram
   - Trouble-shootings

4. **Combustion of Fuels**
   - Theory of combustion
   - Combustion process:-
     - Supply air,
     - Air-fuel mixture,
     - Combustion temperature,
     - Combustion gases, and
     - Temperature of combustion gases.

5. **Non-Destructive Testing Fundamentals**
   - Dye penetrant test
   - Ultrasonic testing
   - Radiographic testing

- Magnetic-particle inspection
- Visual Inspection

6. Material Science and Engineering

- Classification of materials
- Metallic Crystal Structures
- Imperfection in Solids
- Mechanical Properties of Metals
- Material deformations
- Engineering Stress-strain
- Materials testing
- Correlation between Hardness and Tensile Strength
- Failure Mechanism
- Mechanical working of steel
- Heat Treatments of Steels

ABOUT THE INSTRUCTOR



Ir. Mohd Normarzuki bin Ya'acob**,** has graduated with Bachelor (Honors) in Mechanical Engineering from the University of Malaya.

He is a registered Professional Engineer with Practicing Certificate (Mechanical) with Board of Engineer, Malaysia (BEM) and a Corporate Member, The Institution of Engineers, Malaysia (IEM). He is a certified First Grade Engineer (Steam Boiler and Internal Combustion Engine) by the Department of Occupational Safety and Health (DOSH).

He had working experiences with several company such as Equator Engineering Sdn Bhd, Tenaga Nasional Berhad, Petronas Gas Berhad (Gas Processing Plant 5/6 and Centralized Utilities Facility), Qatar Petroleum (Head of Short Technical Training) and currently, he is working with Bayubali Engineering Sdn Bhd as a Managing Director.

Throughout his carrier, he has extensive field experiences in steam boiler operation, troubleshooting, inspection, maintenance and repair. He has also experience in project management, design, selection, specification, installation, maintenance, operation, plant optimization and troubleshooting of utility facilities in the oil and gas industry.

He is the co-author for "An Introduction to Steam Machinery" book published by University of Malaya Publisher.