BAYUBALI LEARNING SOLUTIONS

INTERNAL COMBUSTION ENGINE (ICE) ENGINEERS (INCL. PART B & C) COURSE

Training Dates:	As per schedule	**Training Venue:**	Kuala Lumpur, Malaysia
Basic Fee:	RM4,600.00 + SST per participant (this includes course materials, meals, refreshment and attendance certificate)		

DURATION

28 hours (Four (4) days)

TARGET GROUP

The course is prepared for those who are interested to become competent person (engineers) in Internal Combustion Engine (ICE) and they are; new engineers, team leaders/coordinators, operations engineer, maintenance team leaders, engineers, operations team leaders, inspection, 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 ICE engineers that are willing to sit for the Internal Combustion Engine Engineer's Certificate of Competency examination with the Department of Occupational Safety and Health, Malaysia (DOSH).

COURSE OBJECTIVE

This course will guide the participant to have better understanding on how to pass the Department of Occupational Safety and Health (DOSH) Internal Combustion Engine Engineer's Certificate of Competency Examination.

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

COURSE OUTCOMES

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

- Sit for ICE Engineers' examination conducted by DOSH.
- Describe the ICE fundamental, ICE classification and engine performance.

- Understand on various Piston Engine, 2 –Stroke & 4 -Stroke engine structure, operation and timing diagram, Diesel Combustion Ignition engine, Petrol Spark Ignition engine, Turbocharger, starting system, Lubrication system, Fuel system and Cooling system, Engine operation and maintenance.
- Understand on various Gas Turbine Engine, theory, major components and function, auxiliaries' equipment, Control system, fire protection and instrumentation system, Gas Turbine operation, performance, maintenance
- Understand about material behaviors for any rotation machines
- Understand the DOSH examination question and interview format

TRAINING METHODOLOGY

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

COURSE CONTENTS

Factories and Machinery Act 1967 (Act 139)
- Certificates of Competency – Examinations, Regulations 1970
- Person-In-Charge, Regulations 1970
- Notification, Certificate of Fitness and Inspection, Regulations 1970
- Safety, Health and Welfare, Regulations 1970

An Introduction to Internal Combustion Engine

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

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

Combustion of Fuels
- Theory of combustion
- Combustion process:-

- Supply air,
- Air-fuel mixture,
- Combustion temperature,
- Combustion gases, and
- Temperature of combustion gases.

Non-Destructive Testing Fundamentals

- Dye penetrant test
- Ultrasonic testing
- Radiographic testing
- Magnetic-particle inspection
- Visual Inspection

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

Review of DOSH Examinations

- Part C (Interview) and Part B (Written Examination)

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, trouble-shooting, inspection, maintenance and repair. He has also experience in project management, design, selection, specification, installation, maintenance, operation, plant optimization and trouble-shooting 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.