

WSQ Precision Engineering Framework

COURSE NAME	: Perform Engineering Simulation for the Marine & Offshore Industry
COURSE CODE	: PE-MP-360E-1
PRODUCT COURSE NAME	: 1. ANSYS Workbench Mechanical – Structural Dynamics
	: 2. ANSYS Fatigue Analysis
	: 3. Multibody Hydrodynamics Analysis with AQWA
	: 4. ANSYS CFD Advanced – Fluid Structure Interaction
DURATION	: 8 x 8hrs sessions

*** Singaporeans and Permanent Residents may receive up to 90% funding on course fees from the Singapore Workforce Development (WDA). Terms and conditions apply.**

- This training course is creditable for professional development units (PDUs) by the Professional Engineers Board, Singapore (PEB) under their Continuing Professional Development (CPD) program.
- Students will be awarded a Statement of Attainment (SOA) by WDA upon course completion.

OBJECTIVES

This module, focusing primarily on applications in the marine and offshore industry, is recommended for engineers who wish to perform various engineering analyses related to marine and offshore engineering using Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) simulations. The standard stipulates how to:

1. Analyze the dynamics of structures, including modal analysis, harmonic response analysis and analyzing the effects of random vibration on a structure
2. Analyze fatigue phenomena for both linear and non-linear static structural analyses to investigate the product's durability
3. Perform multi-body hydrodynamic analysis on all types of marine and offshore structures, including diffraction, environment loadings, frequency, time domains, mooring as well as articulations analyses
4. Analyze fluid-structure interaction to understand the interfaces between fluid and structural domains for various marine and offshore applications, such as those related to hull design, ship optimization, impact of waves on freshwater and offshore systems as well as evaluating the response of structures and systems to time-varying ocean waves loads

WHO SHOULD ATTEND

This training course is intended for engineers in the Marine & Offshore industry who are required to perform engineering simulation to validate their designs.

PRE-REQUISITES

Engineering knowledge is required. Familiarity with computer (PC or workstation) and knowledge of Computer Aided Engineering (CAE) are useful.

Participants must have completed the following courses:

- [Apply Engineering Simulation Fundamentals](#)
- [Perform Structural Simulation For Design Verification](#)
- [Perform CFD Simulation For Design Verification](#)

COURSE SYLLABUS

- Basic Structural Dynamics
- Modal Analysis
- Harmonic Analysis
- Response Spectrum Analysis
- Transient Structural Analysis
- Basic Structural Contact
- Advanced Structural Contact
- Basic Post-Processing for Mechanical Stress Simulation
- Assignment of Material Properties
- Stress-Life High-Cycle Fatigue Analysis
- Strain-Life Low-Cycle Fatigue Analysis
- Post-Processing for Results
- Fundamentals of Multibody Hydrodynamics Analysis
- Radiation/Diffraction Analysis
- Post-Processing
- Equilibrium and Stability Analysis
- Frequency Domain Analysis
- Slow Drift Time Domain Analysis
- Survival Wave Time Domain Analysis
- Fully Coupled Cable Dynamics
- Fundamentals of Fluid Structure Interaction (FSI)
- One-way FSI
- Immersed Solids
- Moving Mesh
- 6-dof Rigid Body Solver
- Two-way FSI

Each course chapter is followed by "hands-on" workshops and exercises.

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About the Singapore Workforce Development Agency (WDA)

For Singapore's workforce to remain competitive and employable in today's fast changing workplace, they must have knowledge and skills that are relevant, current and sought after by employers to meet the changing needs of Singapore's economy. In response to these needs, WDA was formed to help companies build capabilities and remain competitive so as to contribute to stronger economic growth for Singapore.

For more information, please visit <http://app2.wda.gov.sg/web/Common/homepage.aspx>.

About the Professional Engineers Board, Singapore (PEB)

Established in 1971, the Professional Engineers Board, Singapore (PEB) is a statutory board in the Ministry of National Development. PEB aims to set and maintain high standards for registering professional engineers, and to regulate and advance the practice of professional engineering.

For more information, please visit <http://app.peb.gov.sg/>.