

## **WSQ Precision Engineering Framework**

<b>WSQ COURSE TITLE</b>	<b>: Perform Engineering Simulation for the Industrial Equipment/ Machinery Industry</b>
<b>WSQ COURSE CODE</b>	<b>: PE-MP-361E-1</b>
<b>PRODUCT COURSE TITLE</b>	<b>: 1. ANSYS Rigid and Flexible Dynamics : 2. ANSYS Workbench Mechanical – Heat Transfer : 3. ANSYS Fatigue Analysis : 4. Introduction to ANSYS Icepak : 5. ANSYS CFD Advanced – Rotating Machinery</b>
<b>DURATION</b>	<b>: 8 x 8hrs sessions</b>

**\* 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.

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### **OBJECTIVES**

This module, focusing primarily on applications in the equipment and machinery industry, recommended for engineers who wish to perform engineering analyses related to industrial equipment and machineries. The standard stipulates how to:

1. Analyze multi-body, rigid and flexible structural dynamics
2. Analyze thermal response of structures and components, focusing on performing steady-state, transient, linear and nonlinear thermal analyses
3. Analyze fatigue phenomena for both linear and non-linear static structural analyses to investigate the product's durability
4. Evaluate cooling solutions with air flow dynamics for their device designs apart from optimizing the performance
5. Analyze rotating machinery simulations through the use of the single reference frame (SRF) model, multiple reference frame (MRF) model, and sliding mesh model (SMM)

## WHO SHOULD ATTEND

This training course is intended for engineers in the Industrial Equipment/ Machinery 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

- Fundamentals of Rigid and Flexible Dynamic Analysis
- Rigid Body Dynamic Analysis
- Harmonic Response Analysis
- Response Spectrum Analysis
- Rigid Body Dynamic Post-Processing
- Flexible Dynamic Analysis
- Fundamentals of Heat Transfer Analysis
- Nonlinear Thermal Analysis
- Transient Analysis
- Radiation Heat Transfer Analysis
- Phase Change 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 Rotating Machinery
- Single Reference Frame (SRF)
- Multiple Reference Frame (MRF)
- Sliding Mesh (SMM)
- Post-Processing for Rotating Machinery Analysis
- Fundamentals of Combustion and Reaction Modeling
- Gas Phase Combustion and Reaction Analysis
- Surface Reaction Involved Analysis
- DPM and Spray Analysis
- Radiation and Pollutant Analysis

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/>.