

## **WSQ Precision Engineering Framework**

<b>WSQ COURSE TITLE</b>	<b>: Perform Engineering Simulation for Defence and Homeland Security</b>
<b>WSQ COURSE CODE</b>	<b>: PE-MP-364E-1</b>
<b>PRODUCT COURSE TITLE</b>	<b>: 1. Introduction to ANSYS Explicit STR</b>
	<b>: 2. Introduction to ANSYS AUTODYN</b>
	<b>: 3. Introduction to ANSYS LS-DYNA</b>
	<b>: 4. ANSYS CFD Advanced – Turbulent Flow</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 Defence and Homeland Security, is recommended for engineers who wish to perform engineering analyses related to Defence and Homeland Security products and processes. The standard stipulates how to:

1. Analyze basic explicit dynamics simulations with emphasis on geometry creation, mesh generation, as well as FEA and CFD simulations in a single environment.
2. Analyze advanced explicit dynamics simulations by focusing on several explicit methods such as Lagrangian solver, Eulerian method, Arbitrary Lagrangian-Eulerian (ALE), smooth particle hydrodynamics (SPH) and even Euler Blast solver to simulate various explicit dynamics phenomena in the real world.
3. Perform highly nonlinear, transient dynamic analyses with emphasis on metal plasticity, contact, and transient phenomena.
4. Perform turbulent flow analyses with optimum turbulence simulation strategy

### **WHO SHOULD ATTEND**

This training course is intended for engineers in Defence and Homeland Security who are required to perform engineering simulation to validate their designs.

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#### **CAD-IT CONSULTANTS (ASIA) PTE LTD**

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## 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 Explicit Dynamics Analysis
- Engineering Data
- Basic Explicit Dynamics Analysis
- Post-processing of Results
- Body Interactions Analysis
- Analysis Settings
- Material Models
- Multi-material Euler Simulation
- Euler Blast (Ideal Gas) Simulation
- ALE Simulation
- Mesh-free (SPH) Simulation
- Euler-lagrange Interactions Analysis
- Elements
- Part Definitions
- Material Definitions
- Loading, Rigid Bodies, and Boundary Conditions
- Contact Surfaces Analysis
- Solution and Simulation Controls
- Post-processing
- Restarting
- Explicit-to-implicit Sequential Solutions
- Implicit-to-explicit Sequential Solutions
- Fundamentals of Turbulence Flow Modeling
- Turbulence Simulation Strategy
- Turbulent Flow Simulation

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/>.