



Project No.  
2053

Date  
2025

Doc. No.  
EOTSS2053

Serial No  
2053/2025

Rev.  
00

Proj. dep.  
Mechanical

EOTSS Doc. CODE :

EOTSS/Mechanical/2053-MECH/2025

المعهد الهندسي لخدمات التكنولوجيا والبرمجيات



Engineering office for Technology and Software Services

## ANSYS Workbench – Simulation for Mechanical Engineers

ANSYS Workbench: Dynamic and Structural Stress Analysis

Course Code: 2053-MECH



Engineering Office for Technology and Software Services Academy

Main Branch: United building – E Shams –Front NBE  
, El Siouf \_Alexandria

Tel: 01102060500-01144470856



الفرع الرئيسي :عمارات المتحدة – عمارة عين شمس – امام البنك  
الاهلي – السيوف- الاسكندرية

تليفون: 01102060500 - 01144470856

E-mail. [adelramadan@eotss-academy.com](mailto:adelramadan@eotss-academy.com)  
[info@eotss-academy.com](mailto:info@eotss-academy.com)



This document and its attachments, if any, contains confidential and proprietary information belonging to EOEST, and/or other third parties, including EOEST. The intended recipient of the information contained herein shall not divulge the same to any third party or sell, trade, publish, reproduce or reverse engineer the same, in any manner, without EOEST prior written consent and/or EOEST prior written consent, and shall not put in use the information for any purpose unrelated to that for which it has been transmitted to recipient. Any disclosure and use of the contents hereof shall be subject to any subsisting agreements between EOEST and the intended recipient. The copyright in this document and/or attachments is owned by EOEST while the underlying IP is owned by other Technology Providers and any reproduction or adaptation thereof shall require EOEST's and/or, when needed, EOEST express written approval



Project No.  
2053

Date  
2025

Doc. No.  
EOTSS2053

Serial No  
2053/2025

Rev.  
00

Proj. dep.  
Mechanical

EOTSS Doc. CODE :

EOTSS/Mechanical/2053-MECH/2025



المعهد الهندسي لخدمات التكنولوجيا والبرمجيات

Engineering office for Technology and Software Services

## Course Overview

This course introduces participants to **ANSYS Workbench**, focusing on **dynamic and structural stress analysis**. It enables learners to build real-world simulation models, interpret results, and optimize mechanical designs using advanced CAE tools.

## Target Audience

- Mechanical Engineers
- Structural Analysts
- Engineering Students
- Professionals interested in Finite Element Analysis (FEA)

## Course Duration

- **4 Weeks** (12 sessions, 3 sessions/week)
- **2 hours per session**
- **Total: 24 Hours**

## Course Objectives

- Understand the core principles of **stress and dynamic analysis** using ANSYS Workbench
- Set up and perform **structural simulations** for various loading conditions
- Analyze results to assess performance and failure risks
- Explore **advanced simulation tools** for multi-physics problems

Main Branch: United building – E Shams –Front NBE  
, El Siouf \_Alexandria

Tel: 01102060500-01144470856



الفرع الرئيسي : عمارات المتحدة – عمارة عين شمس – امام البنك  
الاهلي – السيوف- الاسكندرية

تليفون: 01102060500 - 01144470856

E-mail. [adelramadan@eotss-academy.com](mailto:adelramadan@eotss-academy.com)  
[info@eotss-academy.com](mailto:info@eotss-academy.com)



Project No.  
2053

Date  
2025

Doc. No.  
EOTSS2053

Serial No  
2053/2025

Rev.  
00

Proj. dep.  
Mechanical

**EOTSS Doc. CODE :**

**EOTSS/Mechanical/2053-MECH/2025**



المعهد الهندسي لخدمات التكنولوجيا والبرمجيات

Engineering office for Technology and Software Services

## Course Modules

### Unit 1: Introduction to ANSYS Workbench (Week 1)

- Overview of ANSYS Workbench interface and analysis systems
- Importing CAD models (e.g. from SolidWorks, Fusion 360)
- Defining **material properties** and model configurations
- Applying **boundary conditions** and loading scenarios

### Unit 2: Structural Analysis (Week 2)

- Static structural simulations: **stress, strain, and deformation**
- Understanding **elasticity, yield strength, and fatigue**
- Meshing strategies and result accuracy
- Generating simulation reports and visual results

### Unit 3: Dynamic Analysis (Week 3)

- Linear vs. nonlinear dynamic analysis
- **Modal analysis** for natural frequency and vibration modes
- **Transient and harmonic response analysis**
- Simulating **cyclic and time-varying loads**

### Unit 4: Advanced Techniques & Multiphysics (Week 4)

- **Thermal stress analysis** and temperature effects
- Basics of **Computational Fluid Dynamics (CFD)** in ANSYS
- Advanced **meshing techniques** for complex geometries
- Design optimization and result comparison

Main Branch: United building – E Shams –Front NBE  
, El Siouf \_Alexandria

Tel: 01102060500-01144470856



الفرع الرئيسي : عمارات المتحدة – عمارة عين شمس – امام البنك  
الاهلي – السيوف- الاسكندرية

تليفون: 01102060500 - 01144470856

E-mail. [adelramadan@eotss-academy.com](mailto:adelramadan@eotss-academy.com)  
[info@eotss-academy.com](mailto:info@eotss-academy.com)



Project No.  
2053

Date  
2025

Doc. No.  
EOTSS2053

Serial No  
2053/2025

Rev.  
00

Proj. dep.  
Mechanical

**EOTSS Doc. CODE :**

**EOTSS/Mechanical/2053-MECH/2025**



المعهد الهندسي لخدمات التكنولوجيا والبرمجيات

Engineering office for Technology and Software Services



## Practical Projects

- Structural analysis of a mechanical bracket under static load
- Dynamic simulation of a rotating shaft or lever arm
- Modal vibration analysis for a mechanical assembly
- Thermal analysis of a component with heat dissipation



## Required Tools & Software

- High-performance computer with strong CPU/GPU
- Latest version of **ANSYS Workbench**
- CAD software for geometry modeling (optional but recommended)



## Certification & Learning Outcomes

**Certificate of Completion** will be awarded.

By the end of this course, learners will:

- Set up and run professional **FEA simulations** in ANSYS
- Analyze mechanical systems under static and dynamic conditions
- Build comprehensive simulation reports with visualizations
- Improve design reliability through simulated performance analysis

Main Branch: United building – E Shams –Front NBE  
, El Siouf \_Alexandria

Tel: 01102060500-01144470856



الفرع الرئيسي :عمارات المتحدة – عمارة عين شمس – امام البنك  
الاهلي – السيوف- الاسكندرية

تليفون: 01102060500 - 01144470856

E-mail. [adelramadan@eotss-academy.com](mailto:adelramadan@eotss-academy.com)  
[info@eotss-academy.com](mailto:info@eotss-academy.com)