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المعهد الهندسي لخدمات التكنولوجيا والبرمجيات



Engineering office for Technology and Software Services

🌱 SolidWorks Essentials – 3D CAD for Mechanical Design

SolidWorks Essentials: 3D Design and Technical Drawing

Course Code: 2054-MECH



Engineering Office for Technology and Software Services Academy

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■ Course Overview

This course provides a comprehensive introduction to **SolidWorks**, covering **3D modeling**, **technical drawing**, and **basic simulation**. It is designed for beginners and aspiring mechanical designers looking to master essential CAD skills.

🎯 Target Audience

- Mechanical Engineers
- Product Designers
- Students and hobbyists in 3D CAD

🕒 Course Duration

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

✅ Course Objectives

- Learn SolidWorks interface and core 3D modeling tools
- Design mechanical parts and assemblies
- Create accurate technical drawings
- Perform basic simulations using built-in tools

📁 Course Modules

Unit 1: Introduction to SolidWorks (Week 1)

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- Navigating the SolidWorks interface
- Creating 2D sketches and constraints
- Extruding, revolving, and generating 3D geometry

Unit 2: Part Modeling (Week 2)

- Applying advanced features: **Fillet, Chamfer, Shell**
- Creating patterns: **Linear, Circular, Mirror**
- Editing models and using the **FeatureManager Tree**

Unit 3: Assembly Creation (Week 3)

- Building assemblies with multiple components
- Applying **mates and constraints**
- Conducting **basic motion analysis**

Unit 4: Technical Drawings & Simulation (Week 4)

- Creating detailed **technical drawings**
- Adding dimensions, tolerances, and notes
- Running **SimulationXpress** for basic stress analysis
- Exporting designs to **DXF, STL, STEP, etc.**

Practical Projects

- Model and render a mechanical part
- Create a multi-part assembly with proper constraints
- Prepare and annotate 2D technical drawings
- Simulate the part under simple load conditions

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Required Tools & Software

- A mid to high-spec computer (8GB+ RAM, dedicated GPU recommended)
- **SolidWorks** (latest or student version)

Certification & Learning Outcomes

Certificate of Completion will be awarded.
By the end of this course, learners will:

- Design and modify complex 3D parts
- Assemble components with functional constraints
- Create engineering drawings for manufacturing
- Perform basic simulations to test design performance

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