3D EDUCATORS
Trainers & Consultants

DIPLOMA IN
MECHANICAL ENGINEERING SOFTWARE

Learn Mechanical Software

Who can do?

- Matriculated Passed Candidates
- Engineering Students
- Mechanical Diploma Holders
- Mechanical Technical Assistance
- Machine Operators
- Those people who would like to develop their skills in mechanical engineering based software

100,000+ Students have been Trained

since 1997

Invest in People the only Asset that Appreciates

Program is offered by

3D EDUCATORS - INT

22 Years of Excellence in Training & Development

www.3dedudcators.com
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Diploma in Mechanical Engineering Software

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Program Details

Inauguration

The Training Program will be inaugurated by a senior member of 3DEducators

Program Structure

No of classes per week	**02 Class**
Duration of each class	**02 - Hour**
Total Duration	**160 Hours**

Other Learning Activities

Classroom Assignments	**40**
Presentations by Trainees	**01**
Case Studies	**02**

About the Program Instructor

DIPLOMA IN Mechanical Engineering Software is the course which start from the scratch and covers the demanding mechanical engineering software. All the courses shall be conducted by senior consultants and engineering who have the extensive experience relates to different national and multinational organization

- ✓ Senior Mechanical Engineers
- ✓ Senior Mechanical Programmers

Well qualified and experienced trainers with extensive hands-on and experience to groom the candidates to develop the Mechanical Software skills

They trainers are foreign qualified and having the degrees of PhD, MBA, M.Sc., M.S. and ISO Certified as well.

In Affiliation with

3D EDUCATORS
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Suite # 7, Nobel Heights, Opposite Sales Tax House, KDA Scheme # 7, Main University Road – Karachi
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Program Syllabus

Major Courses of Program

The structure of the training is as follows:

The Program Consist on following major courses

1. AutoCAD 2D/3D Mechanical
2. Revit MEP
3. ANSYS
4. SolidWorks Part Modelling
5. SolidWorks Advance Modeling

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AutoCAD 2D/3D

Chapter 1: AutoCAD Mechanical Design Concepts

- AutoCAD Mechanical Overview
- Mechanical Structure
- Standard Based Design
- Dimension Productivity Tools
- Dimension and Annotation
- Production Drawing Creation
- Standard Content
- Machinery Generators
- Calculation Tools
- Autodesk Inventor Linked Models
- Configuration and Setup Guide

Chapter 2: User Interface

- Interacting with User Interface
- Common Drawing Setup

Chapter 3: Mechanical Structure

- Structuring Data in Drawings
- Reusing and Editing Structured Data
- Structure and Other Tools

Chapter 4: Mechanical Layers and Layer Control

- Layers
- Layer Control

Chapter 5: Tools for Creating Key Geometry Power Snaps

- Core Design Tools
- Centerlines
- Construction Lines
- Designing with Lines
- Adding Standard Feature Data for Holes and Slots

Chapter 6: Tools for Manipulating Geometry

- Editing Tools
- Power Commands

Chapter 7: Mechanical Part Generators

- Standard Parts
- Springs
- Chain/Belt
- Shaft Generators
- Standard Shaft Parts

Chapter 8: Creating Drawing Sheets

- Model Space Views in Layouts
- Title Block and drawing Borders
- Creating Drawing Sheets in Model Space

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Chapter 9: Dimensioning and Annotation Your Drawings

- Creating Dimensions
- Editing Dimensions
- Hole Charts and Fits Lists
- Annotation and Annotation Symbols
- Revision Lists

Chapter 10: Bill of Materials, Parts Lists, and Balloons

- Bill of Materials
- Inserting Parts Lists
- Ballooning Parts

Chapter 11: Design Calculations

- Moment of Inertia
- Moment of Inertia with Predefined Profiles
- Deflection Line
- Shaft Stresses
- The Finite Element Analysis

Chapter 12: Working Without Structure

- Layer Groups
- Part references
- 2D Hide
- Library

Chapter 13: Mechanical Options for the CAD Manager

- Standard Based Design
- Configure Layer, Text, and Symbol
- Properties Configure the BOM, Parts List, and Balloons Configure the Annotation Tools

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REVIT MEP

Day 1

- Introduction to Autodesk MEP
- Understanding Basic Architecture
- Working with Views
- Setting Basic Drawing and Modify Tools
- Modeling Floors
- Modeling Ceilings & Roof

Day 2

- Adding Components
- Understanding Sections & Elevation
- Understanding Room Tags
- Controlling Object Visibility
- Copy & Monitor element

Day 3

- Setup Electrical Settings and Parameters.
- Place Lighting Fixtures and Devices.
- Place Receptacles and Equipment.
- Create Lighting, Switch, and Power Circuits.
- Create Panel Schedules.
- Demonstrate how to Create and Optimize Power Distribution in Revit MEP

Day 4

- Mechanical: Add and use mechanical equipment.
- Mechanical: Add and modify air terminals.
- Mechanical: Add and modify ducts.
- Mechanical: Add and modify return ducts.
- Mechanical: Add and modify duct accessories and fittings.
- Mechanical: Work with heating and cooling zones

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` Day 5

- Plumbing: Add and modify fixtures
- Plumbing: Add and modify piping
- Plumbing: Add and use plumbing equipment
- Plumbing: Create a plumbing system
- Plumbing: Add and modify pipe accessories
- Mechanical: Add and modify placeholder duct
- Mechanical: Define a duct system
- Mechanical: Work with spaces

Day 6

- Mechanical: Create duct/pipe legends
- Plumbing: Add and modify placeholder pipe
- Size duct and pipe systems
- Perform interference check
- Check duct and pipe systems and disconnects

Day 7

- Working in Texting, Arrowheads, Tagging & Dimensions
- Importing Raster Files
- Exporting CAD (.dwg) Format Files
- Working & Handling Default 3D Views, Camera Views & 3D Sections
- Understanding Visibility Graphics/Overrides

Day 8

- Introduction to Worksets and Establishing Project Work-sharing.
- Opening and Saving a Work shared Project as a Central Model.
- Creating and Setting Up Worksets in a Central Model.

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Day 9

- Working in Linking Architecture and Structure.
- Understanding and Setting up View Templates by their Separate Electrical Services.
- Creating sheets and putting views.
- Understanding Rendering.

Day 10

- Creating In-Place Families.
- Creating Generic Family.
- Creating Title Block.

Day 11

- Discussion & working on the generated Question related Revit Course Outline.

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Ansys Workbench

This course provides practical knowledge (with theoretical lectures) to allow engineers to competently perform finite element analysis (FEA) for Structural and Thermal problems. Participants will be able to efficiently predict and evaluate structural and thermal response of various mechanical components by attending this course. Moreover, it will also bring clarity and insight to the students through customized training material (presentations & software workshops) and professional trainer.

6. Introduction to Ansys Workbench
7. Sketching (2D)
8. Geometry making (3D)
9. Meshing Techniques
10. Pre-Processing
11. Post-Processing
12. Solution Controls
13. Result Evaluation
14. Coupled Analysis

Major Domains:

- Static Structural
- Transient Structural
- Explicit Dynamics
- Transient Thermal
- Fluid Flow (Fluent) (Steady State Flow)
- Analysis of Trusses, Disc Brakes & Rolling operations
- Effects of static and dynamic loading on I-sec beam
- Testing strength of a 2mm Titanium plate with a bullet impact
- Thermal analysis of a bimetallic strip and heat flow through the fins
- 2D, axis symmetric & periodic pipe flows
- Heat Exchangers and flow through Elbow pipes
- Analysis of C-D nozzles with subsonic flows
- Stress Analysis of a Propeller airfoil due to wind velocity
- Calculating the natural frequency of I-sec Beam

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Solid Works (Part Modelling)

Lesson 1: Introduction

- About This Course
- What is the SolidWorks Software?
- The SolidWorks User Interface
- The SolidWorks Model
- View Control
- Display Modes
- Creating New Files Using Templates
- Document Properties
- System Options
- Multiple Views of a Document

Lesson 2: Introduction to Sketching

- Basic Sketching
- Sketch Entities
- Rules That Govern Sketches
- Design Intent
- Sketch Relations
- Dimensions
- Sketch Fillets
- Extrude
- Exercise

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Lesson 3: Basic Part Modeling

- Basic Modeling
- Terminology
- Choosing the Best Profile
- Choosing the Sketch Plane
- Sketching on a Planar Face
- Using the Hole Wizard
- Cut Feature
- View Options
- Filleting
- Detailing Basics
- Drawing Views
- Center Marks
- Model Dimensions
- Changing Parameters
- Exercise

Lesson 4: Assembly Basics

- Assembly Basics
- Bottom Up Assembly Approach
- Top Down Assembly Approach
- Manipulating Components
- Degrees of Freedom
- Mate Relationships
- Local Component Pattern
- Section View
- Exploded View
- Exercise

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Lesson 5: Drawing Basics

- Engineering Drawings
- General Drawing Rules
- Dimensions
- Drawing Appearance
- Drawing Templates Choices in SolidWorks
- To Create a New Drawing Using a Document Template
- Sample Drawing Template
- Title Block
- Switching to Edit Sheet Mode
- Detailing Options
- Creating a Drawing – General Procedure
- To Import Dimensions into the Drawing
- Multi-sheet Drawings
- Three View Drawing of Assembly
- Named & Specialized Views
- Exercise

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Solid Works (Advance Modelling)

Lesson 1: Advances Sketching

- Introduction to 3D Sketch
- Splines
- Curves through XYZ
- Dynamic Mirror
- Blocks

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Lesson 2: Advanced Part Modeling

- Equations Driven Modeling
- Sensors in Modeling
- Advanced Hole
- Thread Feature
- Flex Bending
- Symmetry Check
- Draft Analysis
- Sweep with Guide Curves
- Lofts and Boundaries
- Surfaces and Patches
- Using Subtract & Intersect
- Creating Multibody parts
- Configure Features
- Appearances & Textures
- 3D PDF generation
- Simulation Xpress

Lesson 3: Advanced Assembly Modeling

- Top-Down Assembly
- Approach
- Bottom-Up Assembly Approach1
- Assembly Motions & Mates
- Advanced Mates
- Mechanical Mates
- Interference Detection
- Clearance Verification
- Hole Alignment
- Exploded View
- SOLIDWORKS Tree house

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TERMS & CONDITIONS

WITHDRAWAL FROM THE DIPLOMA/CERTIFICATION

Students are not allowed to withdraw from the Diploma. If a student cannot continue the Diploma his/her fee will be forfeited.

CONDUCT AND DISCIPLINE

A disciplinary action, leading to rustication, will be taken against students whose conduct is found objectionable at any time during the course of study. Reference will be made to 3D Educators code of conduct.

EVALUATION AND GRADING

The performance of students is evaluated through continuous observation of a student's performance in the Diploma – class participation, submission of assignments, quizzes and exercises.

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The student will be examined through three hourly exams conducted at the midterm and a final exam at the end of the program. Total marks for passing the Diploma will be 60 out of a total of 100.

Students who do not meet the attendance or any other eligibility criteria will not be allowed to appear in the final examination.

The following grading plan will be applicable for the Diploma:

A	**87 - 100**
B+	**81 -86**
B	**72 - 80**
C+	**66 - 71**
C	**60 - 65**
F	**below 60**

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Students who are unable to appear for the final exam are required to submit a written application stating the reason for not appearing for the exam. 3D Educators reserves the right to approve or deny such applications. If approved, the student will be allowed to sit for the exam within one month. Failure to do so, the student will be resubmit the examination fee and sit the future schedule exam. Without passing of the exams no certification will be awarded.

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ONLINE LIVE CLASSES FACILITY AVAILABLE

- Instructor Led Training
- Real Time Presentations
- Interactive Classes
- Complete Notes and Other Stuff shall be provided through our Secure Student Login Member's Area
- For Online Live Classes, you may please download the Admission Form through our website http://www.3deducators.com. Fill it properly and attached the required document along with Picture and send back to info@3deducators.com with scanned fee submitted voucher in the bank.
- For Pakistan you may submit the fee at any MCB Branch with the title of "3D EDUCATORS-TRAINERS & CONSULTANTS".
- If you are outside Pakistan then you may transfer via Bank to Bank or any western union, Fast Track, Money Gram or else International Transfer Body.
- After Admission, if you don't have GMAIL Account then you are requested to kindly make one GMAIL Account and shared it info@3deducators.com. Then further correspondence shall be made by our institute official.
- Extra Bandwidth Charges shall be incurred.

DISTANCE NOT MATTER

You can join in the live classes Sessions of 3D EDUCATORS – TRAINERS & CONSULTANTS from anywhere of the world.

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PRECAUTIONARY MEASURES

- During Classes, you are requested to make sure that you are in isolated room, where no noise should be there except your voice.
- Kindly Switch Off your Cell Phone during the class, because it will disturb the quorum of class.
- If you have taken the admission in the course online lonely, then ethically it is recommended and suggested that you alone in the class.
- Recording of Lectures are not allowed at your end.

This world is emerging and growing in the 21st Century very rapidly because of latest and remarkable technologies and its advancement. Due to advancement of technology, we 3D EDUCATORS offer Live Interactive class sessions

3D EDUCATORS believe on Information Technology and its systems. Now you can also avail this facility at your home.

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