Mechanism Simulation using Pro/ENGINEER Wildfire 4.0

Overview

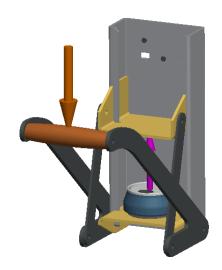| Course Code	TRN-2182-T

Course Length	1 Day

This course is designed for experienced users who want to add motion to their products and analyze dynamic reactions of moving components. In this course, you will focus on learning advanced modeling and analysis skills in this comprehensive, hands-on course. Topics include developing the 3-D model, analyzing the mechanism model, and evaluating results. These topics will enable you to measure dynamic reactions of components, measure the force required to keep a mechanism balanced, and determine the resting state of a mechanism. After completing this course, you will be prepared to work on mechanism designs using Pro/ENGINEER Wildfire Mechanism Dynamics Option. At the end of each module, you will complete a skills assessment. The questions are used to help reinforce your understanding of the module topics and form the basis for review of any topics, if necessary.

Course Objectives

- Understanding the mechanism dynamics option.
- Applying force motors, springs, and dampers to assemblies.
- Applying forces, torques, and gravity to assemblies.
- Creating dynamic analyses.
- Creating force balance analyses.
- Creating static analyses.
- Measuring forces, velocities, accelerations, and other reactions.
- Evaluating results.

Prerequisites

- Introduction to Pro/ENGINEER Wildfire 4.0
- Mechanism Design using Pro/ENGINEER Wildfire 4.0

Audience

- Design engineers and mechanical designers who have a need to add and evaluate the motion of their assemblies.

Agenda

Day 1

Module	1	Introduction to the Mechanism Design Process
Module	2	Adding Dynamic Entities to a Mechanism
Module	3	Analyzing the Mechanism Model
Module	4	Evaluating Analysis Results
Module	5	Project

Course Content

Module 1. Introduction to the Mechanism Design Process
- i.   Introduction to Mechanism Simulation
- ii. Understanding the Mechanism Simulation Process
- iii. Creating the Model
- iv. Verifying the Mechanism
- v.   Adding Dynamic Entities
- vi. Preparing for Analysis of a Mechanism
- vii. Analyzing the Mechanism
- viii. Evaluating Analysis Results

Knowledge Check Questions

Module 2. Adding Dynamic Entities to a Mechanism
- i.   Defining Mass Properties for Dynamic Analyses
- ii. Creating Force Motors
- iii. Creating Springs
- iv. Creating Dampers
- v.   Using Dynamic Properties and Set Zero Position
- vi. Applying Friction and Restitution
- vii. Applying Force and Torque Loads
- viii. Applying Gravity

Knowledge Check Questions

Module 3. Analyzing the Mechanism Model
- i.   Understanding MDO Analysis Definitions
- ii. Configuring a Dynamic Analysis
- iii. Configuring a Static Analysis
- iv. Configuring a Force Balance Analysis
- v.   Defining Initial Configurations
- vi. Creating Measures
- vii. Understanding Redundancies and Degrees of Freedom

Knowledge Check Questions

Module 4. Evaluating Analysis Results
- i.   Running Mechanism Analyses
- ii. Evaluation Playback Results for Collisions
- iii. Configuring Playback Results
- iv. Evaluating Results Using Display Arrows
- v.   Graphing Measure Results

Knowledge Check Questions

Module 5. Project
- i.   The Stunt Bike