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Introduction

Welcome to the Autodesk Inventor Professional 2009: Dynamic Simulation and Stress Analysis Autodesk Official Training Courseware (AOTC), training courseware for use in Authorized Training Center (ATC<sup>®</sup>) locations, corporate training settings, and other classroom settings.

Although this courseware is designed for instructor-led courses, you can also use it for self-paced learning. The courseware encourages self-learning through the use of the Autodesk<sup>®</sup> Inventor<sup>®</sup> Professional 2009 Help system.

This introduction covers the following topics:

- Course objectives
- Prerequisites
- Using this courseware
- CD contents
- Completing the exercises
- Installing the exercise data files from the CD
- Projects
- Notes, tips, and warnings
- Feedback

This courseware is complementary to the software documentation. For detailed explanations of features and functionality, refer to the Help system in the software.

**Course Objectives**

After completing this course, you will be able to:

- Describe the Dynamic Simulation and Stress Analysis environments and the major components of the user interface, and describe and create dynamic simulations and stress analysis results.
- Create a dynamic simulation of a mechanism using joints and environmental constraints, and eliminate redundancy in the design.
- Use the Stress Analysis environment to determine stress, deformation, and natural frequencies on parts.
- Solve engineering and design problems using Dynamic Simulation and/or Stress Analysis.
Prerequisites

This course is designed for experienced Autodesk® Inventor® users who want to learn about the tools and workflows in Autodesk Inventor Professional for simulating the operation of mechanisms and motorized assemblies and predicting part stress and deflection.

It is recommended that you have:

- A working knowledge of parametric part and assembly design using Autodesk Inventor.
- A working knowledge of Microsoft® Windows® 2000, Microsoft® Windows® XP, or Microsoft® Windows® Vista.

Using This Courseware

The lessons are independent of each other. However, we recommend that you complete these lessons in the order that they are presented unless you are familiar with the concepts and functionality described in those lessons.

Each chapter contains:

- **Lessons**
  Usually two or more lessons in each chapter.

- **Exercises**
  Practical, real-world examples for you to practice using the functionality you have just learned. Each exercise contains step-by-step procedures and graphics to help you complete the exercise successfully.

CD Contents

The CD attached to the back cover of this book contains all the datasets you need to complete the exercises in this course.

Completing the Exercises

You can complete the exercise in two ways: using the book or on screen.

- **In the book**

- **On screen**
  Click the AOTC - AIP 2009 Dynamic Simulation and Stress Analysis icon on your desktop, installed from the CD, and follow the step-by-step exercises on screen. The onscreen exercises are the same as those in the book. The onscreen version has the advantage that you can concentrate on the screen without having to glance down at your book.
After launching the onscreen exercises, you might need to alter the size of your application to align both windows.

**Installing the Exercise Data Files from the CD**

To install the data files for the exercises:

1. Insert the courseware CD.
2. When the setup wizard begins, follow the instructions on screen to install the data.
3. If the wizard does not start automatically, browse to the root directory of the CD and double-click Setup.exe.

Unless you specify a different folder, the exercise files are installed in the following folder:

C:\Documents and Settings\All Users\Autodesk Learning\AIP 2009\Dynamic Simulation and Stress Analysis

After you install the data from the CD, this folder contains all the files necessary to complete each exercise in this course. You can also use the Autodesk Learning shortcut on your desktop to quickly access the datasets for each AOTC course on your system.
Projects

Most engineers work on several projects at a time, and each project might consist of a number of files. You can use Autodesk Inventor projects to organize related files and maintain links between files. This courseware has a project file that stores the paths to all the files related to the exercises. When you open a file, Autodesk Inventor uses the paths in the current project file to locate other required files. To work on a different project, you make a new project active in the Project Editor.

Follow the instructions below to locate the *Dynamic Simulation and Stress Analysis* project file for this courseware and make it active.

1. Start Autodesk Inventor Professional.
2. If the Autodesk Inventor New or Open dialog box does not appear, click File menu > Projects.
3. At the bottom of the Projects dialog box, click Browse.
   - Browse to `C:\Documents and Settings\All Users\Autodesk Learning\AIP 2009\Dynamic Simulation and Stress Analysis`.
   - Click *Dynamic Simulation and Stress Analysis.ipj*.
   - Click Open.
   - Click Done.
Notes, Tips, and Warnings

Throughout this courseware, notes, tips, and warnings are called out for special attention.

Notes contain guidelines, constraints, and other explanatory information.

Tips provide information to enhance your productivity.

Warnings provide information about actions that might result in the loss of data, system failures, or other serious consequences.

Feedback

We always welcome feedback on Autodesk Official Training Courseware. After completing this course, if you have suggestions for improvements or if you want to report an error in the book or on the CD, please send your comments to AOTC.feedback@autodesk.com.