Autodesk CFD Essentials

Course Length: 2 days

The Autodesk CFD Essentials training course instructs students in the use of the Autodesk® CFD software. The software provides computational fluid dynamics and thermal simulation tools to predict product performance, optimize designs, and validate product behavior before manufacturing. Through a hands-on, practice-intensive curriculum, students acquire the knowledge required to work in the Autodesk CFD environment to setup and conduct thermal and flow analyses on part and assembly models. Exercises are provided that cover electronic cooling, flow control, and AEC type models.

Topics Covered

- Open and navigate the Autodesk CFD environment to conduct flow and thermal analyses on part and assembly models.
- Use the Model Assessment Toolkit to investigate the suitability of model geometry for analysis, and use Autodesk® SimStudio Tools to make required changes to the CAD geometry.
- Create internal and external fluid volumes.
- Setup analyses by applying appropriate materials, boundary conditions and mesh settings.
- Refine mesh to obtain a proper solution.
- Apply appropriate solver settings to run your analyses and converge to an acceptable solution.
- Use the visualization tools to compare summary images, summary values, and summary plots of your analyses to compare design and scenario results of an Autodesk CFD analysis.
- Conduct a final validation of your solution by running through a validation checklist.

Prerequisites

- This training course assumes that a student has some Flow and Thermal analysis knowledge and can interpret results. The main goal of this student guide is to teach a user that is new to the Autodesk CFD software how to navigate the interface to successfully analyze a model.
- This training course was written using the 20160317 build of the Autodesk CFD software. The software user-interface and workflow may vary if newer versions of the software are being used. The exercises were completed using the advanced solver license. Instructions are provided to complete this class with a basic solver license.
Training Guide Contents

Chapter 1: Getting Started
- Lesson: Introduction to CFD
- Lesson: Getting Started in Autodesk CFD
- Lesson: Autodesk CFD Workflow
- Lesson: When to use Autodesk CFD

Chapter 2: Geometry
- Lesson: Geometry Requirements and Tools
- Lesson: Model Assessment Toolkit
- Lesson: Surface Wrapping
- Lesson: SimStudio Tools Overview
- Lesson: Using Devices to Simplify Geometry

Chapter 3: Materials and Devices
- Lesson: Overview of Materials
- Lesson: Assigning Materials
- Lesson: Using Devices

Chapter 4: Boundary Conditions
- Lesson: Boundary Conditions
- Lesson: Flow and Thermal Conditions
- Lesson: Assigning Boundary Conditions

Chapter 5: Meshing
- Lesson: Meshing Overview
- Lesson: Automatic Mesh Sizing
- Lesson: Mesh Refinement
- Lesson: Manual Mesh Sizing
- Lesson: Shaded Mesh

Chapter 6: Solver Settings
- Lesson: Solving a Simulation
- Lesson: Solving Multiple Designs

Course description shown for Autodesk CFD 2017. Topics, curriculum, and/or prerequisites may change depending on software version.
Chapter 7: Results Visualization & Interpretation

- Lesson: Visualizing Your Results
- Lesson: Global Results
- Lesson: Planes Result Task
- Lesson: Traces Result Task
- Lesson: Iso Surface & Iso Volume Results Tasks
- Lesson: Wall Calculator Result Task
- Lesson: Parts Result Task
- Lesson: Points Result Task
- Lesson: Decision Center

Chapter 8: Validation Checklist

- Lesson: Validating Your Simulation
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