

# Technical Education Services



## Autodesk® Simulation Mechanical - Part 1

Course Length: 2 days

The Autodesk Simulation Mechanical Part 1 Course will guide students through the process of setting up, running, and reviewing the results from a Linear Static Stress Analysis. After attending this course, students will understand the basic workflows involved in preprocessing, including meshing, loads and constraints, and contacts. Students will also be shown how to run multiple load cases and multiple design scenarios in parallel with each other in order to understand the impact of changes made to a model. In addition, those attending the class will be given the tools to interpret their results using the powerful visualization tools integrated into Autodesk Simulation Mechanical, as well as use numerical tools for extracting information.

Topics covered in the Autodesk Simulation Mechanical Part 1 Training Course:

- Basics of FEA
  - Understanding Hooke's law as it applies to FEM and Stress/Strain review
  - Understanding thermal properties and Heat Transfer review (optional)
- Navigating through the user interface with user-customized navigation controls
- Generating a Mesh
  - Best practices for generating meshes (what makes an adequate mesh)
  - Mesh refinement techniques for both feature and model-scale refinements
  - Understanding the differences and uses for Plate/shell meshes vs. Solid Meshes
  - Using the Mesh Convergence Wizard to ensure high quality meshing
- Analysis Workflow
  - Outlining the steps and order of operations for performing an analysis
- Applying Loads and Constraints
- Design Scenarios
  - Leveraging Multiple Analysis Types in the same analysis file
  - Using different load/constraint combinations to test different scenarios simultaneously

Course description shown for Autodesk Simulation Mechanical 2016. Topics, curriculum, and/or prerequisites may change depending on software version.

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- Material Options
  - Material properties required to perform an analysis and how to change them
  - Material libraries and importing materials from the CAD model vs. assigning properties in Simulation Mechanical
- Results Options
  - Results Types and ways to view the contour of those results on the model
  - Applying Probes and using flags to extract results from specific nodes
  - Creating visualizations in the form of Graphs, Images, and Animation
- Defining Contacts between components and controlling contact settings
- Additional Structural Analysis Types
  - Outline of the various “Linear Dynamic” analyses and their purposes
  - Performing Natural Frequency (Modal) analysis and results options available
  - Performing Linear Buckling analysis and results options available

Optional Topics are available to discuss in class depending on applicability to those attending:

- Steady State Heat Transfer
  - Understanding thermal loads and the complexity of a thermal analysis load types in FEA
  - Viewing results for a thermal analysis as temperature maps and heat flux
- Thermal Stress Analysis
  - Importing results from heat transfer analysis into a stress analysis
  - Verifying material properties and analysis settings for thermal stress
- Line Elements
  - Basics drawing commands in Autodesk Simulation Mechanical
  - Applying section properties from a library or user-specified section properties
  - Beam/Line element load types and Beam specific results including code-checking

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## Cancellation Policy

The following cancellation policy shall apply to all training engagements, Live Online, Consulting Services and Dedicated/ Custom Training:

- Company reserves the right to reschedule or cancel the date, time and location of its class at any time. In the event that a Training Class is cancelled by Company, Customer is entitled to a full refund. Company shall not be responsible for any other loss incurred by Customer as a result of a cancellation or reschedule.
- For Customer cancellations when written notice is received (i) at least ten (10) business days in advance of the class, the Customer is entitled to a full refund of its payment or reschedule enrollment, (ii) less than ten (10) business days, Customer shall not be entitled to a refund, but shall receive a class credit to be used within three (3) months of the date of the original class.
- Student substitutions are acceptable with at least two (2) days prior notice to the class, provided substitution meets course prerequisites and is approved by Company's Training Coordinator ([trainingcoordinator@rand.com](mailto:trainingcoordinator@rand.com))
- For all Training orders, cancellation notices must be submitted to [trainingcoordinator@rand.com](mailto:trainingcoordinator@rand.com). Company is not responsible for any error in the delivery of the email notice. In the event of any reschedule of Consulting Services and/or Dedicated/Custom Training by Customer, Company will invoice Customer for all non-cancellable travel expenses.

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