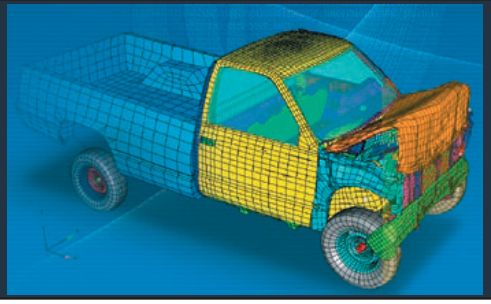
DYT 101/102

# MSC.Dytran



## Course Description

MSC.Dytran is a coupled Euler-Lagrange code designed to solve fluidstructure interaction problems. This seminar seminar, provides an introduction to the Eulerian processor, and shows how it can be coupled to the Lagrangian, or structural parts, of the model. The emphasis of this seminar is on using the programs to solve engineering problems. The capabilities of the program, including typical applications, are covered in detail. Hands-on workshops and example problems reinforce the lecture material.
Advice is offered on modeling techniques, choice of material models, and evaluation of results. In addition, techniques to reduce the cost of analyses are discussed. By the end of the course, attendees should have a basic understanding of how to solve fluid structure
interaction problems using an Euler-Lagrange approach.

## *Prerequisites:*

- A basic knowledge of dynamics is recommended.
- Prior knowledge of FEA is recommended.

## *Topics:*

- Introduction
- Overview of MSC.Dytran capabilities
  - Differences between Lagrangian and Eulerian technology
  - Overview of contact and Euler/Lagrange coupling techniques
  - Typical applications
- Explicit transient dynamic analysis
  - Introduction to explicit solution techniques
  - Explicit versus implicit technology
  - When to use explicit technology
- Input definition
  - Overview of the input file
  - Input file formats and data generation
- Running the analysis
  - Modeling
  - Description of the MSC.Dytran files
  - Example input file
  - Restarts and rezones

For more information on this course please contact Riekert Leibbrandt 0861237837 or email r.leibbrandt@esteq.com

## *Topics:*

- Basic concepts of Lagrange
- Lagrangian capabilities
  - Element library
  - Material models
  - Loads and constraints
- Pre-stressing with MSC.Nastran
- Concept of surfaces in MSC.Dytran
- Lagrangian Interaction Capabilities
  - Contact
  - Tied connections
  - Kinematic connections
  - Breakable connections
- Modeling techniques
  - Mesh design
  - Problem simplifi cation
  - Postprocessing
  - Results interpretation
- When to use Eulerian and Euler-Lagrange coupling
- Typical applications
- Basic concepts of Euler
  - Finite volume method
  - General connectivity
  - Computational cycle
  - User subroutine implementation
- Eulerian capabilities
  - Euler element library
  - Material models
  - Boundary conditions
- General coupling
  - When to use general coupling
  - Theoretical concept of general coupling
  - Input directives
- Basic concepts of arbitrary Lagrange-Euler (ALE)
  - When to use ALE
  - MSC.Dytran ALE implementation
  - Input directives
- ALE coupling
  - When to use ALE coupling
  - Advantages of ALE coupling
  - Implementation in the finite volume concept
  - Input directives
- Modeling techniques
  - Mesh design
  - Problem initialization
  - Coupling techniques
  - Postprocessing