15th LS-DYNA International Conference & Users Meeting

Pre-Conference Training (1 day)

Sunday, June 10, 2018, 9am-5pm

Edward Hotel & Convention Center, Dearborn, MI

Smoothed Particle Hydrodynamics in LS-DYNA®

Instructor: Jingxiao Xu, Ph.D.

Objective

The objective of this course is to provide engineers with the fundamental theoretical background on the SPH formulation, the available formulations, implementations, and the latest developments of the SPH method coupled with the Lagrangian formulation in LS-DYNA, and to teach engineers how to use the SPH options. Detailed descriptions of the data required to run LS-DYNA analyses are given. Examples are used to illustrate the points made in the lectures.

COURSE CONTENT

SPH Formulation Fundamentals

- History of the Method, Variable Smoothing Length.
- Spatial Discretisation of Continuum Equations, Characteristic Lengths.
- Kernel Functions, Method Consistency, Concept of Renormalization.
- Lagrangian, Eulerian Forms of SPH, SPH/Lagrangian Coupling.
- Thermal formulations for SPH, Thermal coupling options between SPH and Solid parts.
- Interaction options between two SPH parts and between SPH and other particle methods (such as DEM).

Practical Examples of SPH and SPH/Lagrangian Coupling

- General Capabilities/Applications (Solids and Fluids).
- Details of an Example: Control Input, Material, Sections, Parts, Outputs.
- Boundary Conditions, Contacts, SPH/Lagrangian Coupling Options, Thermal options for SPH, Interaction options between two SPH parts and between SPH and other particle methods (such as DEM).
- LS-PrePost: Creation of SPH Particles, Visualization of SPH Particles.

For further information regarding pre- and post-conference training, please consult the conference website www.ls-dynaconferences.com or send email to ConfTraining@lstc.com.