



# 15th LS-DYNA International Conference & Users Meeting

**Post-Conference Training (2 day)**  
**Wed & Thurs, June 13<sup>th</sup> & 14<sup>th</sup>, 2018,**  
**9am-5pm** *Edward Hotel & Convention Center,*  
*Dearborn, MI*

## **Fracture, Damage and Failure Using LS-DYNA**

**Instructor: Dr. Ala (Al) Tabiei**

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### **Objective**

This course will allow LS-DYNA users to model Fracture, Damage, and Failure. The different methodology to model failure and fracture in LS-DYNA will be presented and discussed. All formulation in LS-DYNA including Lagrangian, Eulerian, SPH, XFEM, EFG, and the DEM methods etc. will be discussed. Various examples will be presented in 16 hours.

### **COURSE CONTENT**

- Chapter-1 Introduction & Historical Review
  - Brittle Failure
  - Ductile Failure
- Chapter-2 Fundamental Theoretical Concepts
  - Failure Theories
  - Damage Models
  - Fracture Mechanics
- Chapter-3 Material Models with Failure & Damage
- Chapter-4 Fracture & Computational Methods
  - Lagrangian
  - Eulerian
  - SPH
  - SPG
  - XFEM
  - EFG
  - DEM
- Chapter-5 Element Erosion; Advantages & Short Comings
- Chapter-6 Current Capabilities to Model Failure & Damage
- Chapter-7 Current Capabilities to Model Fracture
- Chapter-8 Damage Verification Examples
- Chapter-9 Fracture Verification Examples
- Chapter-10 Other Capabilities to Model Fracture
- Chapter-11 Modeling Delamination and Debonding
- Cohesive Elements
- Tied Contact with Failure
- Chapter-12 Summary and Concluding Remarks

Workshop - There will be several examples, which are designed to understand and reinforce the lectures and the concepts presented in the course.

For further information regarding pre- and post-conference training, please consult the conference website [www.ls-dynaconferences.com](http://www.ls-dynaconferences.com) or send email to [ConfTraining@lstc.com](mailto:ConfTraining@lstc.com).