



Locations:

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Penetration Using LSDYNA

Instructor: Dr. Ala (Al) Tabiei

2 Days - \$1,000 Students \$500 w/student ID

Includes on site continental breakfasts, lunches, breaks, class dinner

Includes 30-day LS-DYNA demo license to practice

Prerequisite: Introduction to LS-DYNA Class, or equivalent experience.
Students should have a command of the LS-DYNA keywords and options associated with typical Lagrangian analyses.

Description: The class is designed for students to use LS-DYNA solve penetration, perforation, and protective structures problems. High energy events. Some mathematical theory is presented for each technique, especially Eulerian and Mesh-free Methods.
Examples are used to illustrate the points made in the lectures.

1. Introduction

- Numerical Techniques to solve High energy problems
 - Lagrangian
 - Eulerian and ALE
 - SPH & EFG
 - Sample applications

2. Intro to FSI

- a. Penetration problems

3. Intro to SPH

- a. Penetration Problems

4. Penetration

- a. **Penetration Simulations Techniques**
- b. Applications:

5. Material Behavior Under Sever Loading

- a. Material Models Library
- b. Strain Rate Effect
- c. What is Available That Works for the Defense Problems
 - i. Isotropic
 - ii. Composites
 - iii. Soil
 - iv. Concrete

6. Failure and Damage Modeling

- a. Fracture
- b. Damage
- c. Element Erosion
- d. Non-local Mat

7. Modeling Techniques

- a. Explosively formed projectiles
- b. Shape charges
- c. Fragmentation modeling

8. Modeling Techniques

- a. Mesh design
- b. Problem initialization
- c. Post-processing

9. Impact Data Reduction and analysis

- a. Intermittent eigen-value analysis
- b. FFT and Filtering

10. References