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## **Rubber, Foam & Viscoelastic Material Models in LS-DYNA**

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

**1.5 Days - \$1,250 Students \$950 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 rubber, foam & viscoelastic materials

**Description:** This is a short course on the advance course on material models in LS-DYNA. This course provides more information on the use of all foam and viscoelastic materials in LS-DYNA. The course will provide more understanding of what materials is used for a particular situation. Examples are used to illustrate the points made in the lectures.

### **Content**

#### **Introduction**

#### **Experimental Characterization**

#### **Material Models for Viscoelasticity**

- \*MAT\_VISCOELASTIC (\*MAT\_6)
- \*MAT\_KELVINMAXWELL\_VISCOELASTIC (\*MAT\_61 )
- \*MAT\_GENERAL\_VISCOELASTIC (\*MAT\_76)

#### **Material Models for Foam in LSDYNA**

- 5 \*MAT\_SOIL\_AND\_FOAM
- 26 \*MAT\_HONEYCOMB
- 38 \*MAT\_BLATZ-KO\_FOAM
- 53 \*MAT\_CLOSED\_CELL\_FOAM
- 57 \*MAT\_LOW\_DENSITY\_FOAM
- 62 \*MAT\_VISCOUS\_FOAM
- 63 \*MAT\_CRUSHABLE\_FOAM
- 73 \*MAT\_LOW\_DENSITY\_VISCOUS\_FOAM
- 75 \*MAT\_BILKHU/DUBOIS\_FOAM
- 83 \*MAT\_FU\_CHANG\_FOAM
- 31 Frazer-Nash Rubber

#### **Material Models For Rubber in LSDYNA**

- 7 Blatz-Ko Rubber
- 27 Mooney-Rivlin Rubber
- 77 \_H Hyperelastic and 77\_O Ogden Rubber
- 87 Cellular Rubber
- 127 Arruda Boyce Rubber
- 181 Simplified Rubber/Foam
- 183 Simplified Rubber with Damage

#### **Material Data & Behavior Demonstration**

#### **Concluding Remarks**