

LS-DYNA® TRAINING

By Predictive Engineering

Implicit and Explicit Nonlinear Static & Transient Analysis for Structural Mechanics



Duration: 32 hours (eight, 4-hr sessions)
When: April 9 (Tuesday) to 18 (Thursday), 2024
Where: Virtual "live" Online Training
Cost: \$3,650.00

What's Included: Digital course training manual, notes and workshop videos provided via Google Drive. It is expected that students will have their own laptops with access to an LS-DYNA license. An LS-DYNA license can be provided at a cost of \$530. This course qualifies for 32-hrs of professional continuing education credits.

Class Schedule and Hours

The class is broken down into eight, four-hour sessions, with one session per day. Class hours are from 8:15 am to 12:45 pm with a 30 min break at 10:15. Class times are based on PT (Portland, OR). We have found that four hours a day is optimal while allowing the student a bit of time to absorb the material and attend to other workday tasks.

Registration: Early registration is encouraged since space is limited to 15 students and it is expected that the class will fill.

To register please send email to:
Training@PredictiveEngineering.com
Attn: George Laird, PhD, PE

About Predictive Engineering

Based in Portland, Oregon, Predictive has 20+ years of experience with LS-DYNA training, consulting, sales, and services. References available at our website:
www.PredictiveEngineering.com



Engineering Short Course

This eight-day, online course is directed toward the engineering professional simulating highly nonlinear static and transient dynamic problems involving large deformations and contact between multiple bodies. Our goal is to provide a broad foundational knowledge of LS-DYNA which can be built upon towards practical individualized usage. Class materials are drawn from our extensive and diverse simulation experience.

The course is fast paced and follows the scientifically proven method that flows from lecture (theory) to hands-on examples (workshops). Most workshops are provided in video format for later review by the students.

Course Outline

Theoretical Foundation

- I. Implicit versus Explicit
- II. Understanding LS-DYNA Keywords and Format (Workshop)
- III. Explicit Time Step - CFL (Workshop)
- IV. Mass Scaling – CMS/SMS (Workshop)
- V. Meshing for Explicit Success (Workshop)
- VI. Explicit Element Technology (Workshop)

LSPP & Material Modeling (

- I. Why It Still Kicks-Ass for Post-Processing
- II. LS-PrePost Efficient Workflow (Workshop)

Material Modeling

- I. Material Modeling: Metals, Elastomers, Foams (Workshop)
- II. Equation of State (EOS)
- III. Material Failure & Fracture (Workshop)
- IV. Rigid Bodies (Workshop)

Contact & Load Initialization

- I. Contact Theory & Application (Workshop)
- II. Edge-to-Edge Contact & Other Pathologies (Workshop)
- III. Tied-Contact: Mesh Transitions, Gluing, Welding (Workshop)
- IV. Negative Sliding Interface Energy (Workshop)
- V. Implicit-to-Explicit Switching: Load Initialization (Workshop)

Drop Test, Damping & Bird Strike (SPH)

- I. Dynamic Relaxation for Bolt Preload (Workshop)
- II. Damping (Workshop)
- III. Drop Test Simulation (Workshop)
- IV. Smoothed Particle Hydrodynamics (Workshop)
- V. Bird Strike / Ballistic Impact (Workshop)

Implicit Analysis: Linear to Nonlinear to Vibration

- I. Observations on Implicit versus Explicit Analysis
- II. Implicit analysis: Linear, Static Stress Analysis (Workshop)
- III. Nonlinear Implicit Analysis with Mortar Contact (Workshop)
- IV. Troubleshooting Nonlinear Implicit Analyses (Workshop)
- V. Normal Modes Analysis, Sine Sweep and PSD Analyses
- VI. PSD Analysis with Fatigue Assessment (Workshop)
- VII. Q&A

Optional Topics (Survey at Start of Class)

- I. Understanding implicit convergence indicators
- II. When is implicit or explicit the right choice?
- III. Building large system models from scratch
- IV. Recommended LS-DYNA practices for complex, nonlinear systems.