

LS-DYNA® TRAINING

By Predictive Engineering

Implicit and Explicit Nonlinear Static & Transient Analysis for Structural Mechanics



Duration: 32 hours (four 8-hr sessions)

When: Nov 16 (Monday) to 19 (Thursday), 2026

Type: In-Person with Networking and Social Events

Where: Portland, OR

Cost: \$3,850.00

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. This course qualifies for 32-hrs of professional continuing education credits.

Class Schedule and Hours: Class hours are from 8:00 am to 5:00 pm with 15-minute breaks at 10:00 am and 3:00 pm. Lunch is at noon and will be catered to the classroom.

Social Activities: Predictive Engineering will have a social hour and dinner for all attendees on Monday night. An award ceremony will be held late Thursday afternoon with light snacks and drinks.

Registration: Early registration is encouraged since space is limited to 20 students and it is expected that the class will fill.

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

Special Note: After more than 20 years of teaching this class, this November will be my last LS-DYNA short course. If you've been thinking about attending, this is the time.

About Predictive Engineering

Based in Portland, Oregon, Predictive has 25+ years of experience with LS-DYNA training and consulting services. References available at our website:
www.PredictiveEngineering.com



Engineering Short Course

This four-day in-person 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 & Post Processing

- 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)
- V. Using AI to generate Material Laws

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)
- VI. Using AI to investigate best practices

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. Using AI to accelerate your model construction and development of material laws
- II. Understanding implicit convergence indicators
- III. When is implicit or explicit the right choice?
- IV. Building large system models from scratch
- V. Recommended LS-DYNA practices for complex, nonlinear systems