

Design exploration

- **Parametric finite element model**
 - Parametric design
 - Parametric analysis
- **Design Of Experience [DOE]**
 - Sensitivity analysis
 - Correlation analysis
- **Meta models**
 - Response surface method [RSM]
- **Optimization**
 - Genetic Algorithm
- **Design methods**
 - Direct design
 - Inverse design
 - optimum design

Dynamic structural analysis

- **Damping**
 - Types of damping
 - Viscous
 - Material
 - Coulomb
 - Numerical
 - Equation of motion
 - Rayleigh damping
 - Alpha damping
 - Beta damping
- **Modal analysis**
 - Governing equations
 - methods
 - Undamped modal

- Damped modal
 - Natural frequency / damped frequency
 - Mode shapes
 - Participation factor
 - Effective mass
 - Damping control
 - Pre-stressed modal
- **Transient structural analysis**
 - Governing equation
 - Time-varying boundary conditions
 - Time integration Methods
 - Implicit
 - Explicit
 - Time step selection
 - Initial condition
 - Damping control
 - Solution techniques
 - Full method
 - Mode-superposition method
 - Post-processing
- **Response spectrum analysis**
 - Generation of Response spectrum
 - Displacement
 - Velocity
 - Acceleration
 - Boundary conditions
 - terminology
 - Participation factors
 - Mode coefficients
 - Response
 - Peak response
 - Zero period acceleration
 - Modal analysis
 - Mode superposition
 - Mode combination methods

- SRSS
- CQC
- ROSE
- Rigid response
- Missing mass response
- Post-processing

Intro to explicit dynamics