

## Course Details

### Day 1 L-Edit

#### Introduction to L-Edit

- Launching L-Edit
- Graphical User Interface
- Opening an existing file
- Customizing the design environment
- Toolbars and Docking Views
- Viewing the curved objects
- Technology Setup (Intro)
  - Units
  - Grids
  - Manufacturing grid, Curve display
- Information Toolbars
- Design Area and Design Area controls
- Mask creation - Positive and Negative masks
- The Layer Palette-
  - Compact and Advanced Layer Palette
  - Layer selection and operations
  - Hide/show
  - Choosing a drawing layer
- Mask Drawing-
  - Drawing toolbar
  - Drawing objects
- Object selection
  - Edge, center
  - Multiple
  - Cycle select
  - Using layer hide show
  - Select all
- Mask Editing-
  - Editing Toolbar
  - Graphical editing
  - Textual editing
  - Changing layers
  - Draw> Move
  - Single, Multiple edits
- MEMS Pro Toolbar functions-
  - Overview
  - Curves
  - Fillet tool
  - Shape recovery

- Viewing Transforms-
  - View menu
  - Zoom/Window Zoom/+/- keys
  - Pan
  - Home
  - Docking Views
- Cells and hierarchy
  - Design/Cell Hierarchy
  - The Design Navigator
  - New cell/Cell Origin
  - Types of cell views
  - Cell commands-Open, Copy
  - Grouping commands
  - Instancing cells
  - Edit Instance dialog- Array
  - Windows management- Cascade, active cell

Exercise: Layout of a tunable filter

- Creating a New Design-
  - Design data file and database types
  - Technology references
- Setup Technology
  - Setting up a tech reference
  - Importing a Technology
  - Exporting a Technology
- Libraries
  - Library Navigator
  - Setting up a Design Library

Exercise: Tech files, libraries

- Setting up layers
  - Setup Layers dialog
  - Adding
    - Purpose
    - Special layers
    - Setup information
    - Rendering, mode and pass
    - Setting up colors
    - Derivation and Boolean operations
    - Generating layers

Exercise: Working with Layers

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- Boolean operations on selections
- Base Points
- Object Snapping
- Alignment Commands
- GDS Export

Exercise: Advanced Layout- RF Switch

Introduction to MEMS Pro

- Toolbar overview
- Process Import/Export
- 3D Model Generation
- Step by step display
- Viewing Controls
- Cross-section
- Region Based 3D Visualization
- Z-Scaling
- 3D model Output

Exercise: Tunable filter: 3D Modeling

MEMS Pro Advanced

- Material Properties Setup
- Process Definition Setup
- Process commands

Exercises: RF Switch – Tech Setup

Day 2

L-Edit

Advanced Layout topics

- Additional Layout commands
  - Tips
  - Multigrid toolbar
  - Find commands
  - Rulers
- Curves
  - Edge conversion
  - Conversion from Polygon
  - Chamfer/Fillet
- Wires
  - Setup

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- Usage
- Built-in Macros
  - Mask bias
  - Image Import
  - Text Generator
- Cell Operations
  - Flattening
  - Editing in Place
  - Hierarchy Navigation
  - Locking
  - ClipOut
  - Save to TDB
- Advanced Boolean Operations
  - Select- Inside/Outside
  - Touch/Select/Overlap
  - Cut/Vertex
  - Area/Density
- MEMS Pro Toolbar features
  - Curves
  - Device Generators
  - Easy MEMS
- Design Setup
  - Selection
  - Drawing
- Application Setup
  - Keyboard/Mouse
  - Rendering
  - Selection/Editing
  - Palettes
  - Text Editor
  - Text style
- Open Access features
- UPI- scripting
- T-Cells

Exercise: Scripting

- DRC

Exercise: DRC

- DXF input/output
- Design kits Exercise: Design kit

Advanced MEMS Pro

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- Defeaturing models
- Document Fabrication Process
- Multi-model output
- Process Documentation- EXCEL, ppt
- Model Documentation-Camera, Movie

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- Boundary Conditions on Layout

Exercise: Boundary Conditions

- 2D Models
- Hierarchical output
- Stand alone Viewer
- Links to FEM Tools
- Using SoftMEMS in a team

### Day 3

- Review of Output files to send to FEM
- Read-in of files from other software
- Viewing input data from SoftMEMS
- Setting up simulation
- Launching simulation
- Viewing results
- Scripting

Exercise: FBAR or PMUT

- MATLAB toolbox overview
- Reading in models in the MATLAB toolbox

Exercise: MATLAB

- Running Multiple simulations in MATLAB
- Sweeps, Statistical analysis

Exercise: Multiple model processing

- Additional MEMS examples- Packaging etc
- Advanced Topics in FEM
- Demo of upcoming release