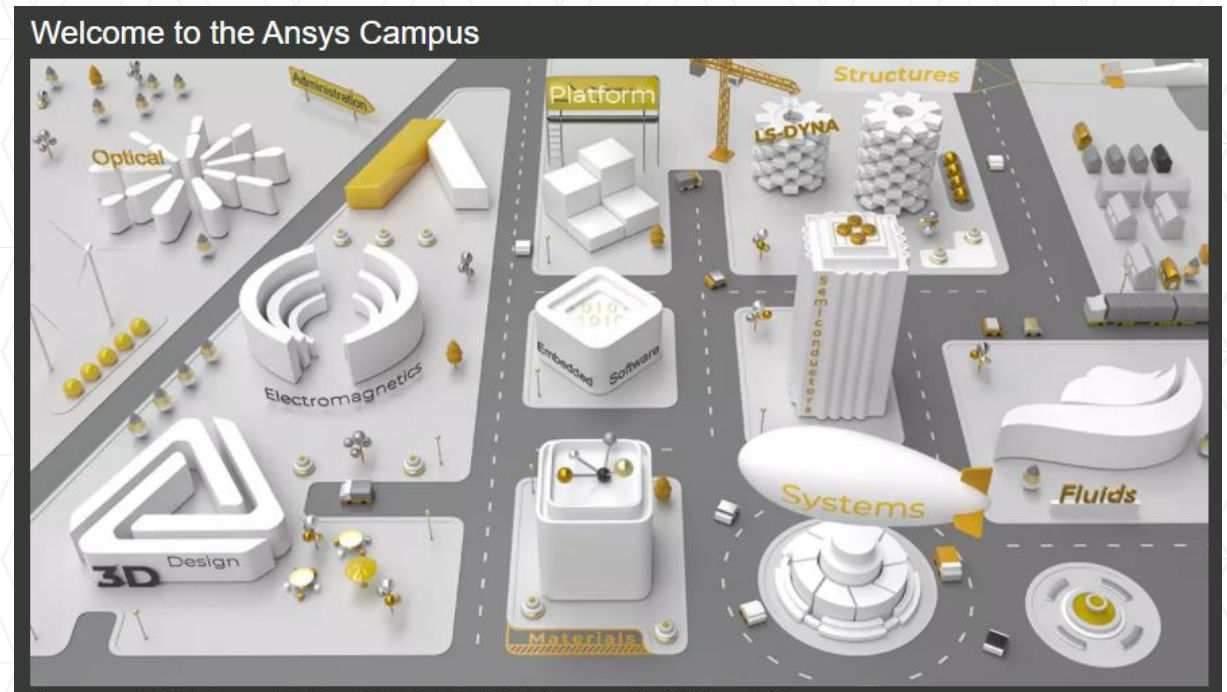


# Ansys Learning Hub

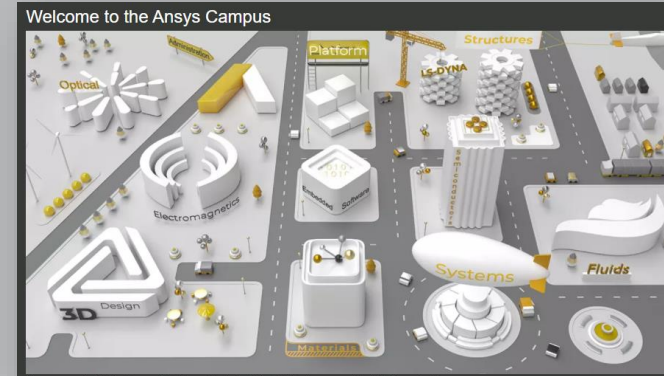
What You Need When You Need it



# What is Ansys Learning Hub (ALH)

**ALH** is a learning management system and centralized knowledge portal that offers **rich learning resources** and **continuous learning** experiences to Ansys customers **across the portfolio**.

The training focus on making the user **become productive** with the **ANSYS Tools in the most efficient way** and range from typical software training, to fundamental theory to application learning.



*Learning on ALH and the Ansys Campus is easy, efficient and flexible, cost effective and fun!*



### Self-paced Learning

900+ recorded video modules  
240+ hours



### Collaborative Learning Rooms

45+ Topic Specific Learning Rooms  
with "learn from the expert"  
material and live feed for Q&A.



### Live Classroom Classes

200+ In-Center Classes per  
year



### Live Virtual Classes

300+ Virtual Classes per year



### Course Material

240+ courses  
1000+ workshops

# ANSYS Campus Buildings – Full Portfolio Coverage

## Welcome to the Fluids Building

**Basic Workflow**

- Getting Started
- Fundamentals

**Physics**

- Aeroacoustics
- Combustion & Reactions
- Multiphase
- Turbulence & Heat Transfer

**Component Interaction**

- Fluid-Structure Interaction
- Moving Parts
- Turbo-machinery

**Specialty Tools and Workflow**

- Aircraft Icing
- ANSYS Polyflow
- Battery Modeling
- Customization
- Optimization
- Post-Processing
- Pre-Processing

**Fluids**

**ANSYS Fluent Getting Started (New Fluent Experience)**

**Mixing Tank Tutorials**

- Do you want to learn:
  - Geometry and mesh requirements for mixing tank problems?
  - Set up and use of rotating blades (e.g. using MRF)?
  - Modeling blending, residence time distribution (RTD), vortex shape prediction, and gas sparging using different multi-phase modeling approaches?

**ANSYS Fluent Getting Started (Classic Workflow) 2020 R1**

### The Fluids Building hosts:

- |                   |                                |
|-------------------|--------------------------------|
| ANSYS CFX         | ANSYS DesignXplorer            |
| ANSYS Fluent      | ANSYS EnSight                  |
| ANSYS Chemkin-Pro | ANSYS ICEM CFD                 |
| ANSYS Energico    | ANSYS Meshing                  |
| ANSYS FENSAP-ICE  | ANSYS OptiSLang                |
| ANSYS Forte       | ANSYS DesignModler             |
| ANSYS Polyflow    | ANSYS Reaction Workbench       |
| ANSYS Turbo Tools | ANSYS SpaceClaim DirectModeler |

## Welcome to the Electromagnetics Building

**High Frequency**

- HFSS Getting Started
- Signal & Power Integrity
- Antenna & Microwave Systems

**Low Frequency**

- Maxwell Getting Started
- Electric Machines
- Power Electronics
- Transformers

**Thermal Management**

- Thermal Management

**Electromagnetics**

**ANSYS 5G Chips to Cities.mp4**

**ANSYS is the Leader in Simulation – From Chips to Cities**

**Across All Major Physics**

**Golden Signoff Multiphysics Solutions**

**Multiscale Modeling nm-nm**

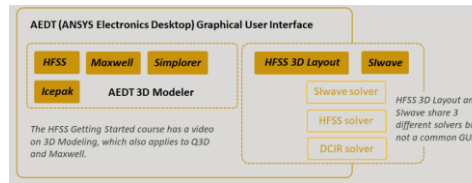
**INTRODUCTION TO 5G ANTENNA DESIGN**

**NEW Class Available:**

**ANSYS HFSS 3D Components, Boundary Conditions, Ports and Mesh**

### The Electromagnetics Building hosts:

- ANSYS HFSS
- ANSYS Icepak
- ANSYS Maxwell
- ANSYS Pexpert
- ANSYS Simplorer
- ANSYS Siwave



## Welcome to the Optical Building

**Basic Workflow**

- SPEOS Getting Started

**Simulation Speed**

- OPTIS HPC

**Optical**

**Physical Models**

- Optical Simulation
- Expert Tools
- Visualization
- Optimization

**Solutions**

- Automotive Lamps
- Automotive Sensors
- Virtual Cockpit

**Optics Building hosts:**

- ANSYS Speos
- ANSYS Speos for NX
- ANSYS Speos for Creo Parametric
- ANSYS Optis HPC
- ANSYS SpaceClaim Direct Modeler

### The Optics Building hosts:

# ANSYS Campus Buildings – Full Portfolio Coverage

## Welcome to the Structures Building

**Basic Workflow**

Getting Started | Fundamentals

**Physics**

Composites | Dynamics | Explicit Dynamics

Durability | Nonlinearities | Materials

**Physical Models**

**Specialty Tools & Workflows**

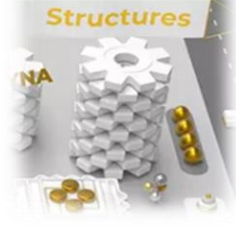
Additive Manufacturing | Electronics Reliability | Offshore

Stent

**Core Concepts for Everyone**

Advanced Practices | Mechanical APDL | Customization

Optimization



**Upcoming Events in Additive Manufacturing**

Meet the Experts Master Classes

**Make EVEN Better Simulations**

A Second Series of Events

### The Structures Building hosts:

- |                      |                          |                                 |
|----------------------|--------------------------|---------------------------------|
| Ansys Mechanical     | Ansys Mechanical APDL    | Ansys Meshing                   |
| Ansys Additive Print | Ansys Motion             | Ansys OptiSLang                 |
| Ansys Aqwa           | Ansys Composite PrepPost | Ansys SpaceClaim Direct Modeler |
| Ansys Autodyn        | Ansys nCode DesignLife   | Ansys SpaceClaim Meshing        |
| Ansys ACT            | Ansys Sherlock           | Ansys DesignModeler             |

## LS-DYNA Building

**LS-DYNA Building**

Getting Started | Applications | Advanced Practices

Optimization | Implicit

**Curriculum Updates & Highlights**

**Jul-2020 NVH, Fatigue, and Frequency Domain Analysis with LS-DYNA (LR) NEW**  
This course introduces a wide range of features of LS-DYNA in frequency domain analysis (vibration, acoustics, and fatigue, etc.) and time analysis, etc.). This course also discusses the application of these features in NVH, acoustic, and durability analysis.

**Jul-2020 Introduction to Ansys LS-OPT (LR) NEW**  
This course provides an introduction to design optimization using Ansys LS-OPT. Design optimization theory and fundamentals are discussed including shape optimization. This course will also teach optimization applications for material model calibration using various c

**Jul-2020 Ansys LS-PrePost Advanced (LR) NEW**  
This new course on LS-PrePost Advanced highlights features that can be of immense use to advanced users of LS-DYNA. Features like scriptin productivity and throughput of engineers.

**Jun-2020 Airbag Folding in Ansys LS-DYNA (LR) NEW**  
This course presents various airbag folding and morphing methodologies, along with a discussion of their respective advantages and disad knowledge of modeling airbag folding process.

**May-2020 Material Characterization for Metals, Polymers and Foams (LR) NEW**  
This course will teach you to calibrate Metals, Thermoplastics, Foams and Elastomers. You will also be able to learn how to define tests, wh calibrate materials for LS-DYNA.

**May-2020 Ansys LS-DYNA Advanced (LR) NEW**  
This course will provide a comprehensive understanding of Explicit Time Integration, Elements, Materials and Contact for solving small to la

### The LS-DYNA Building hosts:

Ansys LS-DYNA

## Welcome to the Materials Building

**Materials | GRANTA Selector**

This learning room supports GRANTA MI Pro

- make smart ma
- quickly identify
- use materials tc

**Materials | GRANTA MI Enterprise**

This learning room supports GRANTA MI Enterprise users to

- manage a single source of r reference, design and simul organization
- find GRANTA MI training resources appropriate to their role, from data users and editors to database administrators and developers
- explore videos, past webinars, exercises, reference sheets, example files and documentation

### The Materials Building hosts:


GRANTA Selector  
GRANTA MI Pro  
GRANTA MI Enterprise




# ANSYS Campus Buildings – Full Portfolio Coverage

## Welcome to the Embedded Software Building

**Embedded Software | HMI**




**Embedded Software | Control**



This learning room supports

- new and advanced users of the Ansys Scade Architect and Ansys Scade Avionics package.


**Embedded Software | Certification**



This learning room supports

- new and advanced users of the Ansys Scade Architect and Ansys Scade Avionics package.

**Embedded Software | Architect**



This learning room supports


- new and advanced users of the Ansys Scade Architect and Ansys Scade Avionics package.

### The Embedded Software Building hosts:

- Ansys Scade Architect
- Ansys Scade Display
- Ansys Scade Suite
- Ansys Scade Test
- Ansys Scade Solutions for ARINC
- Ansys Scade Solutions for ISO


## Semiconductors | Getting Started

**Ansys PathFinder Getting Started**




- There are industry standards behind checking for ESD failures (HBM, CDM). Is there a way for me to check if my layout is robust to meet those standards?
- I need a tool that has the capacity and accuracy to run layout ESD analysis on large IP and SOC.
- How can I identify potential layout connectivity issues that could contribute to sub-optimal ESD discharge paths?
- How can I find and isolate potential layout mistakes in ESD bus like insufficient vias or use of lower metal feed through connections that can toast my chip during an ESD event?

**Ansys PowerArtist Getting Started**




- How can I get early power estimate during my RTL design?
- Can I get early visibility of activity/power profile for different use-cases including emulation?
- How can I find opportunities to optimize wasted power in my design?
- What is the recommended RTL based power methodology for designers?

**Ansys RedHawk Getting Started**




- The industry standard in power-noise and reliability verification sign-off.
- How do I assess the power integrity of my power and ground grids from grid prototyping to sign-off?
- How can I tell if there's an electromigration issue of my PG or signal nets?
- How can I co-simulate the effects of a package and die, and visualize weaknesses in the package?
- Easily generate a Chip Power Model (CPM) for package/board-level analysis.

**Ansys RedHawk-SC Getting Started**



- The next-generation power integrity sign-off tool, built on the SeaScape platform.
- Redefining signoff methodology using early analytical checks and higher coverage algorithms.
- How do I take advantage of elastic compute and big data analytics in designing for power integrity and reliability?
- Can I simulate multiple corners and scenarios in a scale-able way?
- How do I assess the voltage drop impact to timing?

**Ansys Totem Getting Started**



- My analog mixed-signal design needs to be checked for power integrity (IR drop) and reliability issues such as power and signal EM.
- I'm interested in early grid weakness analysis as well as the ability to do signal analysis without any simulation vectors.
- How can I visualize and root-cause potential IREM issues in the design and layout?
- How do I generate an accurate model of IP for SOC-level power integrity signoff?

### The Semiconductors Building hosts:

- Ansys PowerArtist
- Ansys Totem
- AnsysPathFinder
- Ansys RedHawk
- Ansys RedHawk-SC

## Welcome to the Systems Building

**Basic Workflow**

- VRXPERIENCE Getting Started
- Twin Builder
- VRXPERIENCE Sound
- Driving Simulator

**Virtual Reality Experience**

- Design Studio & Perceived Quality
- Visualization

**Solutions**


- Automotive Lamps
- Automotive Sensors
- Virtual Cockpit
- Battery Modeling

**Driving Simulator**

- Driving Simulator Expert Tools

**Safety, Reliability and Cybersecurity**

- Ansys medini

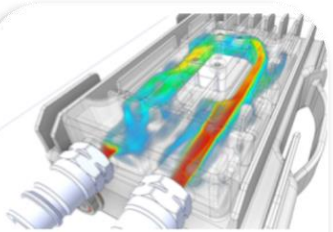


### The System Building hosts:

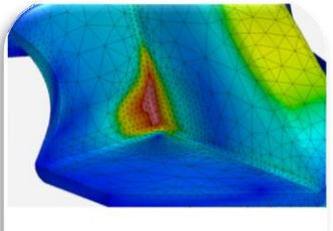
- Ansys Twin Builder
- Ansys VRXPERIENCE
- Ansys Medini

# ANSYS Campus Buildings – Full Portfolio Coverage


## 3D Design




**Ansys Discovery Live**  
Easy-to-use tools allow interactive exploration and iteration of ideas. Simulation results appear in real time and provide directional guidance for more informed decisions.




**Ansys Discovery AIM**  
Intuitive and complete upfront simulation tools to validate concepts. Guided workflows, optimization tools and proven Ansys solvers deliver accurate results and design insights.



**Ansys SpaceClaim**  
Multipurpose 3D modeling for concept modeling, design, manufacturing, reverse engineering, 3D printing and simulation preparation.




**DISCOVERY TUTORIALS**



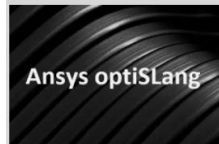
**DISCOVERY 2-MINUTE QUICK TIPS**

**The 3D Design Building hosts:**  
Ansys Discovery Live  
Ansys Discovery AIM    Ansys Discovery SpaceClaim


## Welcome to the Platform Building



**Ansys Minerva**

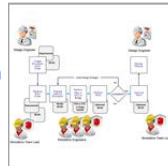




**Ansys optiSLang**




**Ansys Cloud**

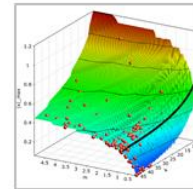
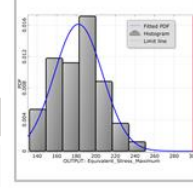
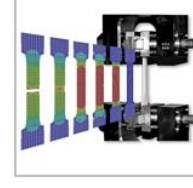
**Simulation and Product Development Management**

**How to use configure and use Ansys Cloud**



**Ansys optiSLang Product Quality (Robust Design Optimization)**

**The Platform Building hosts:**  
Ansys Cloud  
Ansys Minerva                      Ansys OptiSLang

# ANSYS Learning Hub – Private Rooms and Customisation

For companies with corporate subscriptions Ansys can in collaboration with the customer create a private space. The private learning room could include:

- Account and role specific learning paths streamlining the use of the ALH and giving guidance to relevant learning.
- Accumulated account specific learning and knowledge material from the Ansys account team.
- Knowledge sharing in internal forums.
- Possibility to upload and gather internal simulation best practice within the company.
- Possibilities for managers to monitor learning progress of the engineers within the private room.
- Payed customized e-learning modules to further streamline the learning paths and maximize productivity.

DummyCorp Private Learning Room

Private  
1 Member  
+ Invite More

Overview Learning by Role DummyCorp Best Practice

Quick Search

Search this Group...

Upcoming Events

Thu Dec 19 2019  
Internal Review of Best Practice for ProjectX  
Milestone

Thu Feb 13 2020  
Private ANSYS Training in ANSYS Mechanical at Headquarters  
Training

Go To Events

Thermal Engineer  
LEARNING PATH

Foundation Courses provide the basic preparation and supporting concepts for this role.  
Core Courses provide the essential central knowledge for this role.  
Elective Courses offer advanced, supplementary, or specialized topics for this role.  
Number of learning Hours represents the typical total amount of time needed to complete the lecture and the workshop portions of the course.

Foundation Courses  
Analysis:  
- ANSYS Mechanical Getting Started (16 Hours)  
- ANSYS Fluent Getting Started (Single Window Workflow) (24 Hours)  
Geometry:  
- Introduction to ANSYS SpaceClaim for FEA Users (12 Hours)  
Optimization:  
- Introduction to ANSYS DesignOptimizer (20 Hours)

Core Courses  
Heat Transfer:  
- ANSYS Mechanical Heat Transfer (12 Hours)  
- ANSYS Fluent Heat Transfer Modeling (8 Hours)

Elective Courses  
Cooling Systems:  
- Introduction to ANSYS Icepak (24 Hours)

ANSYS Customer Portal

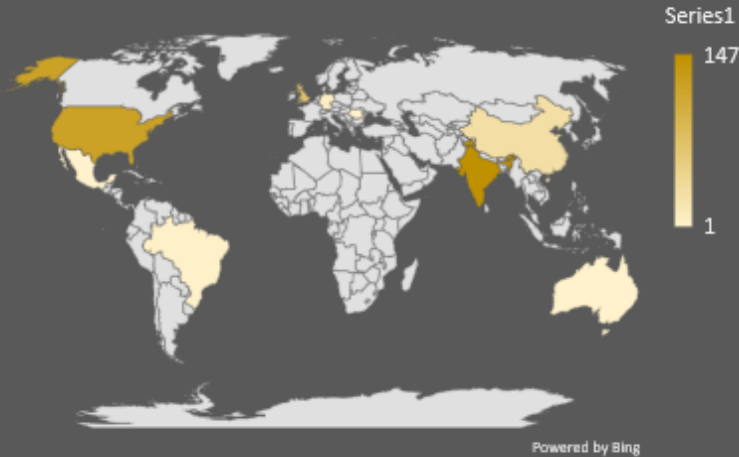
Got Something to Share?

Discussion  
Parametric Thermal Analysis in Mechanical  
Chris Clemon · 45 minutes ago

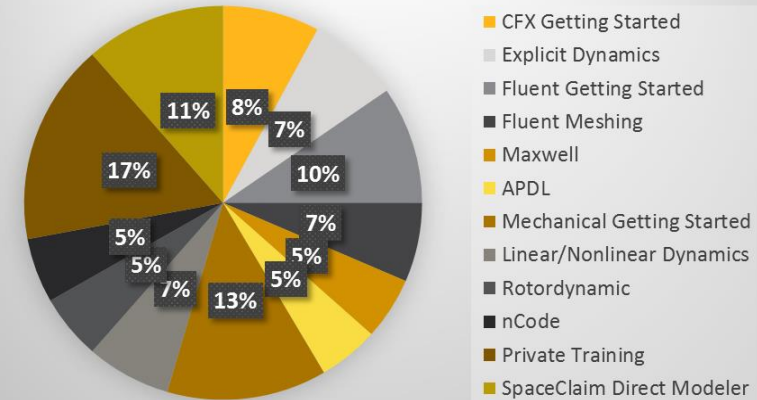
# ANSYS Learning Hub – Private Rooms and Customisation

Usage Report  
Driving  
Professional  
Development

Global Enrollment



Topic Statistics



Type	Metric Item	By 11/3/2017	By 12/4/2017	Avg.	Peer
Public	ALH Accounts	239	252	153	1039
	Total Hours of Live Lecture Training Taken	840 / 3.5 hrs.	937 / 3.7 hrs.	482 / 3.2 hrs.	5489 / 5.3 hrs.
	Total Self-Paced Course Modules Completed	196	220	223	3496
	Total # of Users Completed a Course / (%)	84 / 35%	90 / 36%	49 / 32%	289 / 28%
Private	Total Hours of Live Lecture Training Taken	831	831	337	1540
	Private Learning Room Visits	234	234	N/A	2252
	Private Learning Room Content Views	30	30	N/A	1089



**Thermal analysis for electronics (ICEPAK)**

- Capable to handle types of heat transfer: Conduction, Convection and radiation: Combination of all modes of heat transfer
- Import of mechanical 3D models:
  - Should be able to import CAD geometries from solid works, PRO\_E, Auto Cad, etc. and should be able to cleanup and simplify the CAD models if needed.
  - Should be able to identify electronics objects from the imported CAD geometry and convert them automatically in native objects
  - Should be able to maintain bi-directional connectivity with CAD software's
  - Should be able to handle STEP, IGES, ACIS or Para solid formats.
- Import for ECAD-and PCB models:
  - Should be able to import PCB models along with board, vias with layers connectivity from software's like cadence, Allegro, Cadstar etc.
  - Should be able to import gerber, gds, ODB++, AEDB files.
  - Should be able to import and model traces with complete details.
  - Creation of models:
  - Should be able to build components required for cooling of PCB along with details such as vias, layers, Packages, Sources, heat sinks, Vents, fans, filters etc.
- Libraries:
  - Materials:
    - Metals like aluminum, aluminum alloys, copper, nickel gold etc. should be available. The different types of material grades and conditions of aluminum namely HE30, HE 15 etc. to be available.
    - Data base of non-metals like ceramics, polymers, laminates, glasses, minerals should be available.
    - Components: Inbuilt package libraries like TO-220, SOIC, TO-241, SIP, DIP, FPGa's, CPLD's etc. to be provided.
    - Thermo-Electronic coolers: Data base of single & multistage TEC to be provided.
    - Data base of interface materials like thermal components (manufactures like 3M, Aavid, etc) to be provided.
    - Heat sinks: Standard heat sinks of different manufactures like Aavid, Thermshield etc to be provided. Minimum of 500 No's of heat sink database to be provided.
    - Database of two-resistor components to be available.

- 2D & 3D heat source elements for power generation devices.
- Ability to create custom-built database and libraries to be provided.

- Boundary Conditions

- Import power maps in form of X, Y, Z, P. X, Y and Z are the coordinates and P is the heat flux

- Meshing:

- Provision of automatic & manual meshing to be available
- Automatic meshing for fluid & solid regions to be available
- Different type of mesh models like body fitted Cartesian mesh etc. to be available to represent complain shapes in the electronic model.
- Ability to import external mesh in addition to native mesh

- Post Processing:

- 2D & 3D color shades of temperature at various planes and locations: Result at any particular point should be available even though monitoring points are not marked before start of simulation.
- Ability to perform the post processing of multiple projects in single window for comparison
- Ability to perform automatic post processing for similar cases in case of parametric trials.
- Isosurface contours to locate min & Max variable quantities
- Contours on various cutting planes (x,y,z & user defined planes).
- Summary options to build custom summary reports
- Automatic generation of summary report in MS office

- Types of flow:

- Laminar, transition & turbulent flows to be available
- Ability to model multiple fluids to be available.

- Simulation:

- Transient, steady state and parametric analysis to be available
- Joule heating in objects with temperature dependent properties supported
- In case of transient simulation, ability to model variables as a function of time should be available.
- Capability to parameterize all geometry details, material properties, boundary conditions and even make the objects active and in-active.
- Ability to perform optimization on any of the variables like: material properties, object location, power

dissipation, presence and absence, turbulence models, flow regime etc.

- **Materials:**
  - Constant and variable input material properties Variable resistance, temperature dependent resisting modeling.
  
- **Multiphysics Simulations:**
  - Bi-directional coupling with SIwave for electro-thermal analysis with automatic transfer of power dissipation on PCB along with temperature dependency on material properties
  - Bi-directional coupling with Q3D, Maxwell, HFSS for node to node EM loss mapping and coupled electro-thermal simulation
  - Bi-directional coupling with Mechanical for thermo-structural analysis
  - Importing of Chip Thermal model powermap from Apache Redhawk for accurate power dissipation from chip level tool along with die level metal distribution

## Specifications of Ansys LS-DYNA

- Solver Methods
  - ✓ Full 2D and 3D Capabilities
  - ✓ Nonlinear Dynamics
  - ✓ Rigid Body Dynamics
  - ✓ Explicit Analysis
  - ✓ Implicit Analysis
  - ✓ Quasi-Static Simulations
  - ✓ NVH, Fatigue and Frequency Domain Analysis
  - ✓ BEM (Boundary Element Method)
  - ✓ ICFD (Incompressible Computational Fluid Dynamics)
  - ✓ DEM (Discrete Element Method)
  - ✓ XFEM (Extended Finite Element Analysis)
  - ✓ Normal modes
  - ✓ Linear Statics
  - ✓ Thermal Analysis
  - ✓ Fluid Analysis
  - ✓ Eulerian Capabilities
  - ✓ ALE (Arbitrary-Lagrange-Eulerian)
  - ✓ FSI (Fluid structure Interaction)
  - ✓ Navier-Stokes Fluid
  - ✓ Compression Fluid Solver, CESE (Conservation Element & Solution Elements)
  - ✓ FEM-Rigid Multi-Body Dynamics Coupling (MADYMO, Cai3D)
  - ✓ Underwater Shock
  - ✓ Real-Time Acoustics
  - ✓ Implicit Springback
  - ✓ Multi-Physics Coupling
  - ✓ Structural-Thermal-Coupling
  - ✓ Adaptive Remeshing
  - ✓ SPH (Smoothed Particle Hydrodynamics)
  - ✓ SPG (Smooth Particle Galerkin)
  - ✓ EFG (Element Free Galerkin)
  - ✓ Radiation Transport
  - ✓ EM (Electromagnetism)
- Pre-Processing
  - ✓ Interactive Intuitive Interface
  - ✓ Integrated with solver and post-Processor
  - ✓ Wizard for Ease of setup
  - ✓ Visual Checking of Data
  - ✓ Data Checking During Model Creation
  - ✓ Comprehensive Restarting Capabilities: All valid Data can be Modified/Added/Removed at any stage
  - ✓ Material Data Libraries (250+)
  - ✓ Context-Sensitive Online Help
  - ✓ Enabling Keyword Commands
- Post-Processing

- ✓ Visualization for Large Datasets
- ✓ Interactive Intuitive Interface
- ✓ Integrated with Solver and Pre-Processor
- ✓ Animation wizard and Editor
- ✓ Stand-Alon Free Viewer for 2D and 3D Animations
- ✓ Contour and Isosurfaces
- ✓ Element Examine Probe
- ✓ Vectors
- ✓ Material Location and Status
- ✓ Gauge Time History plotting
- ✓ Part Histories
- ✓ Result Profile
- ✓ Multiphysics Result Visualization with LS-PrePost
- Parallel Processing
  - ✓ SMP, MPP and Hybrid Computation Technology
  - ✓ Single and Double Precision Solver
  - ✓ Windows, Linux, UNIX
  - ✓ Automatic Decomposition
  - ✓ User-Defined Decomposition
  - ✓ Scalable Solver
- Material Library
  - ✓ Metals
  - ✓ Plastics
  - ✓ Glass
  - ✓ Foams
  - ✓ Fabrics
  - ✓ Elastomers
  - ✓ Honeycombs
  - ✓ Concrete & Soils
  - ✓ Viscous Fluids
  - ✓ Composites
  - ✓ Cohesive Material Models
  - ✓ User-Defined Materials
  - ✓ Features In Material Models
    - Failure
    - Equation of State
      1. Linear Polynomial
      2. JWL
      3. Sack Tuesday
      4. Gruneisen
      5. Ratio of Polynomials
      6. Linear Polynomial with Energy Leak
      7. Ignition and Growth of Reaction in HE
      8. Tabulated Compaction
      9. Tabulated
      10. Ideal Gas

- 11. Phase Change
- 12. Gasket
- 13. MIE Gruuneisen
- 14. Murnaghan
- 15. User Defined EOS etc.
  - Anisotropic
  - Damage
  - Unique Tension/Compression
  - Thermal
- Boundaries and Loads
  - ✓ Initial Conditions
  - ✓ Translational Velocities
  - ✓ Angular Velocity
  - ✓ Gravity
  - ✓ Arbitrary Time Varying
  - ✓ Energy Deposition
  - ✓ Pressure
  - ✓ Point Load
  - ✓ Edge Load
  - ✓ Fluid/Material Flow Inlet
  - ✓ Fluid/Material Flow Outlet
  - ✓ Rigid Wall
  - ✓ Translational Velocity Constraint
  - ✓ Rotational Velocity Constraint
  - ✓ Angular Velocity Constraint
  - ✓ Blast Loads
  - ✓ Mask Loads for Forming Applications
  - ✓ Prescribed Boundary Conditions (Displacement Velocity and Acceleration)
  - ✓ Boundary Single Point Constrains
  - ✓ Reflecting and Non-Reflecting Boundary Conditions
  - ✓ Temperature Boundary Conditions
  - ✓ Ambient Boundary Conditions
  - ✓ Symmetry Boundary Conditions
- Element Library
  - ✓ Beams (Standard, Trusses, Discrete, Cables and Webs with over 10 Beam Element Formulations)
  - ✓ Discrete Elements (Springs and Dampers)
  - ✓ Lumped Inertial
  - ✓ Lumped Masses
  - ✓ Accelerometers
  - ✓ Sensors
  - ✓ Seatbelts
    - Pretensioners
    - Retractors

➤ Sliprings

- ✓ Shells (3,4,8 and 8-Node including 3D shells, Membranes, 2D Plane Stress, Plane Strain, and Axisymmetric Solids with over 25 Shell Elements Formulations)
- ✓ Solids (4 and 10-Node Tetrahedrons, 6-Node Pentahedrons with Over 20 Solid Elements Formulations)
- ✓ SPH Elements
- ✓ Thick Shells (8-Node)
- Contact Algorithm
  - ✓ Flexible Body Contact
  - ✓ Flexible Body to Rigid Body Contact
  - ✓ Rigid Body to Rigid Body Contact
  - ✓ Edge-To-Edge Contact
  - ✓ Eroding Contact
  - ✓ Tied Surfaces
  - ✓ CAD Surfaces
  - ✓ Rigid Walls
  - ✓ Draw Beads
- Support Tools- LS-PrePost, LS-OPT, LS-TASC, LS-Run
- Documentation
  - ✓ Context-Sensitive Online Help
  - ✓ User's Manual
  - ✓ Installation
  - ✓ Tutorials
  - ✓ Theory Manual
  - ✓ Release Notes