

## TEST AND OPTIMIZATION LAB

- The Test and Optimization Lab is equipped with the latest hardware and software required to measure noise and vibration, and the measured data is used for further optimization of the system.

LMS (Leuven Measurement Systems International) SCADAS Mobile – 8 Channel Data Acquisition System capable of measuring (transducer electronic data reader).

- Noise
- Vibration
- Impact
- Force.

### Software's Installed:

- Virtual Lab.
- *Imagine Lab.*
- Test Lab.
- Samcef

### LMS Virtual. Lab

LMS Virtual. Lab is an integrated suite of 3D FE and multibody simulation software which simulates and optimizes the performance of mechanical systems for structural integrity, noise and vibration, system dynamics and durability. Using the LMS Virtual. Lab suite, engineering teams can:

- Build accurate simulation models
- Simulate mechanical design behavior
- Quickly assess multiple design alternatives
- Optimize designs before prototype construction
- Accurately detect weak spots
- Efficiently explore multiple design alternatives

### LMS Imagine. Lab 14

Improved usability and process efficiency in LMS Imagine. Lab 14 help you accelerate model-based systems engineering

LMS Imagine. Lab 14 brings a broad range of enhancements aimed at ensuring a smooth user experience through all phases of the design cycle.

New methodology guides and process-related features allow you to design innovative products faster. A set of enhanced capabilities supporting controls validation, real-time simulation and central processing unit (CPU) time reduction allows you to easily address engineering challenges when designing both mechanical parts and controls.

To meet the needs of increasingly complex transverse engineering organizations, LMS Imagine. Lab 14 continues the trend toward openness, which is a key element in streamlining collaborative work. To facilitate model-based systems engineering, LMS Imagine. Lab provides you the appropriate tools to manage the complexity of architecture description and configuration as well as to structure, secure and capitalize on your simulation engineers' work.

### **LMS Test.Lab**

Combining multi-channel data acquisition, comprehensive integrated testing solutions and data management for test-based engineering.

LMS Test.Lab offers you a complete, integrated solution for test-based engineering that combines high speed multi-channel data acquisition with a full suite of integrated testing, analysis and report generation tools. LMS Test.Lab is designed to make testing more efficient and more convenient and significantly increases your productivity by delivering more reliable results, even when the availability of prototypes is dramatically reduced.

### **LMS Samcef Solver Suite**

FEM solver solution suite for basic linear structures to advanced, flexible nonlinear mechanisms and thermal applications.

- The LMS SamtechSamcef Solver Suite is based on the finite element method (FEM) and covers a wide range of mechanical, thermal and thermo-mechanical applications – from basic to very advanced – primarily in the aerospace, defense and automotive industries.
- You can apply the mechanical FEM solver solutions to linear applications such as linear static computations, modal and buckling analyses, linear dynamic simulations, super element generation, random excitations and shock responses. You can also perform nonlinear transient simulations within this family of FEM solvers.
- The FEM solvers can account for the material nonlinearities, geometric nonlinearities, contact conditions, large rotations and kinematic constraints. A dedicated module is also available for high-speed rotating machines. Thermal simulations allow solving transient analysis including convection, conduction, radiation and ablation.
- Several modeling levels are available, including 2D plane stress or plane strain, harmonic and multi-harmonic, cyclic symmetry and full 3D. FEM solver modules are part of the same family; you can switch from one analysis to another (convert a linear simulation to a transient nonlinear simulation), combine analyses (thermo-mechanical, pre-stressed modal analysis) or conduct co-simulations. With parallel computing capabilities, the LMS Samcef Solver Suite also allows you to solve very large finite element models.

To solve following type of analysis:

- Samcef Nonlinear Structural Analysis
- Samcef Nonlinear Motion Analysis
- Samcef Linear Structural Analysis
- Samcef Thermal
- Samcef Fracture Mechanics
- Samcef Amaryllis

### Courses Offered:

S.No	Domain	Course Name	Hours	Prerequisites
01	LMS	LMS Test.Lab-Signature Testing & Analysis	30	Basic Knowledge of FEM/ Advanced Simulation process & Solutions
02	LMS	LMS Test.Lab-Modal Testing and Analysis	30	Basic Knowledge of FEM/ Advanced Simulation process & Solutions
03	LMS	Vibration Measurement & Analysis	20	Basic Knowledge of FEM/ Advanced Simulation process & Solutions
04	LMS	1D Simulation using Imagine.Lab	30	Basic Knowledge of FEM/ Advanced Simulation process & Solutions