



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade, ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram - 521230, Krishna District, Andhra Pradesh, India

Department of Aerospace Engineering

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A.Y:2022-23

FDP Report on Advanced Simulation using ANSYS

Title	One -week Faculty Development Programme on “Advanced Simulation using ANSYS”	
Program Schedule	08-05-2023 To 13-05-2023	
No. of Participants	75 (online Mode)	
Resource Persons	Mr.Raj Mahendra, Simulation Engineer Mr.B.R.M.V. Krishna, Simulation Engineer Mayinkrish Ventures PVT LTD, Hyderabad.	
Faculty Coordinator	Mr.Nazumuddin Shaik Assistant Professor Dept of Aerospace Engineering	Mr.S.Indrasena Reddy Sr.Assistant Professor Dept of Aerospace Engineering

The Department of Aerospace Engineering organized a One-Week Online Faculty Development Programme (FDP) on “**Advanced Simulation using ANSYS**” was conducted from 08-05-23 to 13-05-23. The programme was organized with the objective of enhancing the knowledge and technical skills of faculty members, researchers, and industry professionals in the areas of finite element modeling, structural analysis, and crashworthiness simulations using advanced engineering software tools.

This Faculty Development Programme (FDP) aims to provide participants with comprehensive knowledge and practical skills in advanced engineering simulations using ANSYS. The programme covers finite element analysis (FEA), computational fluid dynamics (CFD), thermal analysis, nonlinear simulations, optimization techniques, and multiphysics applications. Through expert lectures, demonstrations, and hands-on sessions, participants will learn to solve complex engineering problems and integrate simulation-based learning into teaching, research, and industrial consultancy.

Target Participants

- Faculty Members of Engineering and Technology Institutions
- Research Scholars
- PG Students
- Industry Professionals

Prerequisites

Basic knowledge of engineering mechanics, thermodynamics, fluid mechanics, and numerical methods is desirable.

Programme Objectives

The FDP aims to:

1. Introduce participants to modern simulation-driven engineering practices.
2. Develop expertise in ANSYS Workbench and its analysis modules.
3. Enable faculty to perform structural, thermal, and fluid-flow simulations.
4. Demonstrate advanced nonlinear and dynamic analyses.
5. Explore optimization and multiphysics applications.
6. Enhance research and consultancy capabilities through simulation tools.

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ABOUT THE INSTITUTE

The Lakireddy Bali Reddy College of Engineering (LBRCE) was established in the year 1998 by Lakireddy Bali Reddy Charitable Trust, whose architect is Er. Lakireddy Bali Reddy garu. The institute is established with the sole aim of providing high quality educational opportunities in the field of science, engineering, technology and management. It is spread over 60 acres of sprawling lush green landscape spotted with orchids and grooves. It is approved by AICTE, affiliated to JNTUK, Kakinada and attained autonomous status in the year 2010. It attained NAAC accreditation status with 'A' Grade. The institute is certified by ISO: 9001-2018.

ABOUT THE DEPARTMENT

The Department of Aerospace Engineering was started in the year 2011. The department offers 4 years undergraduate program, B.Tech in Aerospace Engineering. The department has a team of highly qualified, dedicated and motivated faculty and well-equipped laboratories. The department has laboratories, classrooms, faculty rooms, sophisticated lab equipment's and well-versed library. The department has a wide range of teaching activities.

ABOUT THE PROGRAMME

The One-Week Faculty Development Programme (FDP) on "Advanced Simulation using ANSYS" is designed to provide participants with comprehensive knowledge and hands-on experience in engineering simulation and finite element analysis (FEA) using ANSYS software.

The programme aims to bridge the gap between theoretical concepts and practical applications by introducing advanced simulation techniques widely used in academia, research, and industry.

Participants will gain exposure to ANSYS Workbench, geometry creation, meshing strategies, structural analysis, thermal analysis, computational fluid dynamics (CFD), and multiphysics simulations. The FDP emphasizes real-world engineering problem-solving through case studies, project-based learning, and practical demonstrations.

The programme is intended for faculty members, research scholars, postgraduate students, and industry professionals seeking to enhance their skills in simulation-driven design and analysis. By the end of the programme, participants will be able to model complex engineering systems, perform simulations, interpret results, and apply advanced computational tools in teaching, research, and product development activities.

ELIGIBILITY

The programme is open to all Faculty Members, Research Scholars and M.Tech students of AICTE approved Engineering colleges and Industry personnel working in the concerned/allied areas of Engineering.

Registration Link:

https://docs.google.com/forms/d/1mE0qVIP8iNHF34-WU70groDuG_wdCvrrZcljvulkBZI

RESOURCE PERSONS

Mr.Rai Mahendra Simulation Engineer
Mr.B.R.M.V. Krishna, Simulation Engineer
Mayinkrish Ventures PVT LTD, Hyderabad.

Address for Correspondence & Registration

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**One -week Faculty Development
Programme on "Advanced Simulation using
ANSYS"
08-05-23 to 13-05-23**



Chief Patrons

Sri Lakireddy Jaya Prakash Reddy
Honorary Chairman

Sri Lakireddy Prasad Reddy
Chairman

Patrons
Sri G. Srinivasa Reddy
President, LBRCT

Dr. K. Appa Rao
Principal

Convener
Dr.P.Lovaraju
*Professor & HOD
Aerospace Engineering*

Co-Ordinator's
Mr.Nazumuddin Shaik
Assistant Professor
Mr.S.Indrasena Reddy
*Sr.Assistant Professor
Dept of Aerospace Engineering*

Organized by:
DEPARTMENT OF AEROSPACE ENGINEERING
(Accredited by NBA under Tier-I)
**LAKIREDDY BALI REDDY COLLEGE OF
ENGINEERING(AUTONOMOUS), MYLAVARAM**
N.T.R (Dt), A.P.

Detailed Schedule

Day 1: Fundamentals of Engineering Simulations and ANSYS Workbench

Session I

- Introduction to Simulation-Based Engineering
- Role of CAE in Product Design and Development
- Overview of ANSYS Software Ecosystem
- ANSYS Workbench Interface

Session II

- Geometry Creation and Import
- Meshing Fundamentals
- Mesh Quality Assessment
- Material Property Definition

Hands-on Exercise

- Static Analysis of a Cantilever Beam
- Stress and Deformation Evaluation

Day 2: Advanced Structural Analysis

Session I

- Static Structural Analysis Techniques
- Boundary Conditions and Load Applications
- Modal Analysis

Session II

- Natural Frequencies and Mode Shapes
- Harmonic and Transient Dynamic Analysis
- Vibration Response Assessment

Hands-on Exercise

- Structural Analysis of Machine Components
- Dynamic Response Evaluation

Day 3: Nonlinear and Fatigue Analysis

Session I

- Fundamentals of Nonlinear Analysis
- Material and Geometric Nonlinearity
- Contact Modeling

Session II

- Fatigue and Life Prediction
- Failure Assessment Methods

Hands-on Exercise

- Contact Analysis of Mechanical Assemblies
- Fatigue Life Estimation

Day 4: Thermal and Multiphysics Simulations

Session I

- Heat Transfer Fundamentals
- Steady-State Thermal Analysis
- Transient Thermal Analysis

Session II

- Thermal Boundary Conditions
- Thermal-Structural Coupling
- Introduction to Multiphysics Simulations

Hands-on Exercise

- Electronic Component Cooling Analysis
- Thermal Stress Evaluation

Day 5: Computational Fluid Dynamics (CFD) Using ANSYS Fluent

Session I

- Introduction to CFD
- Governing Equations and Solution Methods
- Geometry Preparation and Meshing for CFD

Session II

- Flow and Heat Transfer Simulations
- Post-Processing and Result Interpretation

Hands-on Exercise

- Internal Pipe Flow Analysis
- Heat Exchanger Performance Simulation

Day 6: Optimization, Research Applications, and Industry Case Studies

Session I

- Design Exploration and Optimization
- Parametric Studies

Session II

- ANSYS Applications in Research
- Publishing High-Quality Simulation-Based Research

Valedictory Session

- Participant Project Presentations
- Assessment and Feedback
- Certificate Distribution

Hands-on Exercise

- Design Optimization of an Engineering Component

Learning Outcomes

Upon successful completion of the **One-Week Faculty Development Programme on “Advanced Simulation using ANSYS”**, participants will be able to:

1. Understand the fundamentals and advanced features of the ANSYS Workbench environment.
2. Develop and analyze engineering models using simulation-driven design approaches.
3. Apply advanced meshing techniques and select appropriate element types for accurate analysis.
4. Perform structural analyses, including linear, nonlinear, static, dynamic, and buckling simulations.
5. Conduct thermal and Computational Fluid Dynamics (CFD) analyses for engineering applications.
6. Interpret simulation results effectively and validate designs based on engineering principles.

Participants' Feedback

The participants expressed a high level of satisfaction with the FDP. Key feedback points include:

- The programme provided a balanced combination of theoretical knowledge and practical demonstrations.
- Hands-on sessions helped participants gain confidence in using ANSYS Workbench and its modules.
- Real-world case studies enhanced understanding of industrial applications of simulation tools.
- The resource persons effectively explained complex concepts in an interactive manner.
- Participants found the online sessions well-organized and beneficial for academic and research activities.
- The FDP motivated faculty members to integrate simulation-based approaches into teaching and research.
- Participants recommended conducting advanced-level follow-up workshops on specialized ANSYS modules.

Overall Rating: Excellent / Very Good (as reported by the majority of participants).

Conclusion

The One-Week Faculty Development Programme on “Advanced Simulation using ANSYS”, organized by the Department of Aerospace Engineering, Lakireddy Bali Reddy College of Engineering (Autonomous), Mylavaram, successfully achieved its objectives of enhancing participants' knowledge and practical skills in engineering simulation. The programme provided valuable insights into advanced modeling, meshing, structural, thermal, CFD, and multiphysics analyses using ANSYS software.

The FDP concluded with a renewed commitment among participants to adopt simulation-driven methodologies in teaching, research, consultancy, and product development, thereby contributing to innovation and excellence in engineering education and practice.