Institutional Internship Program in CATIA, SOLIDWORKS, XFLR5, JAVA FOIL, QBLADE, ANSYS FLUENT & MATLAB

The Institutional Internship Program, held from ***17th May 2023 to 2nd June 2023***, aimed to provide students with practical experience and proficiency in various software tools used in engineering and design such as ***CATIA, SOLIDWORKS, XFLR5, JAVA FOIL, QBLADE, ANSYS FLUENT, and MATLAB.***

Objectives:

The internship had clear and specific objectives cantered around the utilization and proficiency development in the mentioned software tools. The objectives were as follows:

Gain Familiarity with CATIA: The objective was to familiarize myself with CATIA, a comprehensive CAD software widely used in engineering and design. The aim was to develop proficiency in 3D modeling, assembly design, and simulation capabilities offered by CATIA.

Develop Proficiency in SOLIDWORKS: The internship aimed to enhance my skills in SOLIDWORKS, a powerful CAD software extensively used for product design and engineering. The objective was to gain hands-on experience in creating complex 3D models, conducting simulations, and generating engineering drawings.

Learn and Apply XFLR5 and JAVA FOIL: The internship aimed to introduce me to XFLR5 and JAVA FOIL, specialized software tools used in aerodynamics for airfoil design and performance analysis. The objective was to understand the principles of aerodynamics, generate airfoil designs, and assess their performance using these tools.

Acquire Proficiency in QBLADE: The objective was to gain proficiency in QBLADE, a software tool used for wind turbine rotor blade design and analysis. The aim was to learn the functionalities of QBLADE and apply it to analyze rotor blade performance parameters.

Gain Hands-on Experience with ANSYS FLUENT: The objective was to develop practical skills in using ANSYS FLUENT, a widely used computational fluid dynamics (CFD) software.

The aim was to learn how to set up fluid flow simulations, analyze results, and interpret data for engineering applications.

Enhance MATLAB Proficiency: The internship aimed to enhance my proficiency in MATLAB, a powerful numerical computing software. The objective was to develop skills in data analysis, algorithm development, and simulation using MATLAB for engineering applications.

Methodology

The internship program followed a structured approach to achieve the objectives. It included workshops, project assignments, and mentorship sessions to provide hands-on training and guidance. The methodology ensured steady progress and skill development in each software tool.

Day 1: May 17, 2023 & Day 2: May 18, 2023

CATIA Familiarity: Participants gained familiarity with CATIA through practical sessions and guidance from ***Mr. Jini Raj R, Assistant Professor - AE***. The basics of 3D modeling, assembly design, and simulation using the software were taught. By the end of the internship, participants were able to create complex 3D models and simulate their behavior.

Day 3: May 19, 2023 & Day 4: May 22, 2023

SOLIDWORKS Proficiency: Under the guidance of ***Dr. Konada Sirikonda Mallik, Assistant Professor – AE***, participants developed proficiency in SOLIDWORKS. Practical projects provided hands-on experience in creating intricate 3D models, conducting simulations, and generating engineering drawings. This experience enhanced participants' understanding of product design and engineering principles.

Day 5: May 23, 2023 & Day 6: May 24, 2023

XFLR5 and JAVA FOIL: With the guidance of ***Mr. Praveen N***, ***Assistant Professor – AE,*** participants learned to use XFLR5 and JAVA FOIL for airfoil design and performance analysis. Practical exercises enabled participants to apply these tools and analyze the performance of airfoils.

Day 7: May 25, 2023 & Day 8: May 26, 2023

XFLR5 and JAVA FOIL: Under the guidance of Mr. Jini Raj R and *Mr. Suraj S Rao, Assistant Lab Instructor – AE*, participants were introduced to XFLR5 and JAVA FOIL for airfoil design and performance analysis. The session focused on the principles of aerodynamics and how these tools can be utilized to generate airfoil designs and assess their performance. Practical exercises provided hands-on experience in using XFLR5 and JAVA FOIL, analyzing airfoil characteristics, and optimizing their performance.


Day 9: May 27, 2023

QBLADE: Continuing with the topic of aerodynamics, participants learned about QBLADE, a software tool used for wind turbine rotor blade design and analysis. Mr. Jini Raj R and Mr. Suraj S Rao guided the participants through the functionalities of QBLADE and its applications in analyzing rotor blade performance parameters. Practical exercises helped participants gain practical knowledge in utilizing QBLADE to optimize wind turbine designs, considering factors such as lift, drag, and power output.

Day 10: May 29, 2023

MATLAB Proficiency: Under the guidance of Mr. Praveen N. and Mr. Suraj S Rao, participants explored MATLAB, a powerful numerical computing software. The session focused on the basics of MATLAB programming, data analysis, algorithm development, and simulation for engineering applications. Hands-on exercises enhanced participants' proficiency in MATLAB and equipped them with the skills necessary to tackle engineering problems using this versatile software.

Day 11: May 30, 2023

CATIA Sketching and Part Design: Dr. Konada Sirikonda Mallik and Mr. Suraj S Rao led a session on sketching and part design using CATIA software. The focus was on developing proficiency in creating 2D sketches, converting them into 3D models, and performing part design operations. Participants learned to utilize the various tools and features offered by CATIA to create complex designs and assemblies.
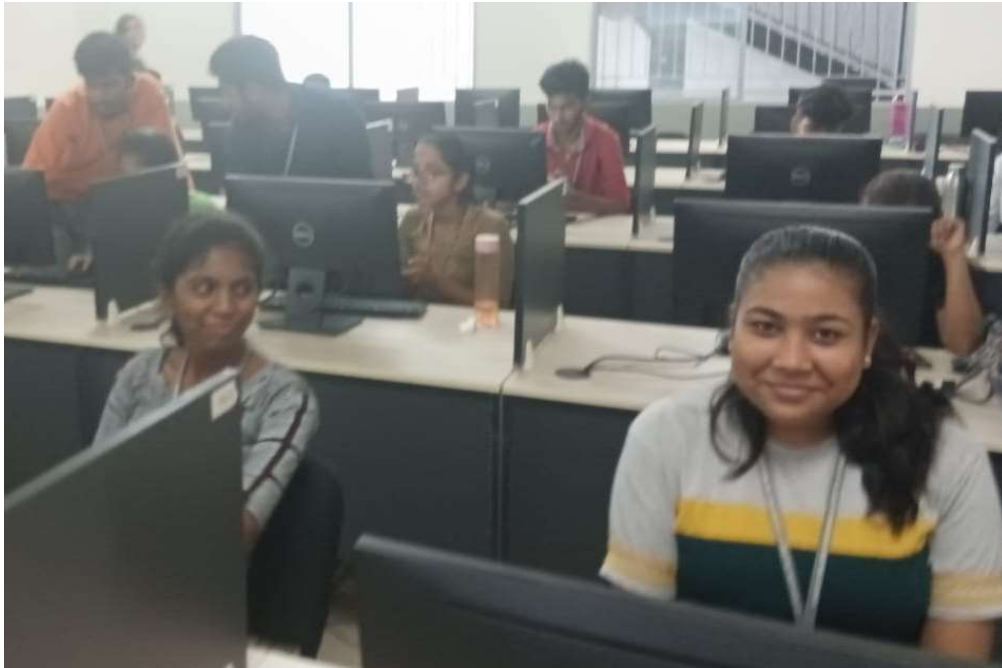
Day 12: May 31, 2023

CATIA Drafting and Assembly: Building upon the previous session, Dr. Konada Sirikonda Mallik and Mr. Suraj S Rao conducted a session on drafting and assembly using CATIA software. Participants gained practical experience in generating engineering drawings, applying geometric dimensioning and tolerancing (GD&T) principles, and assembling components into a complete product.

Day 13: June 1, 2023

CATIA Wireframe Modelling: Another session led by Dr. Konada Sirikonda Mallik and Mr. Suraj S Rao focused on wireframe modeling in CATIA. Participants learned how to create wireframe models, which are essential for conceptualizing and visualizing complex geometries. The session enabled participants to represent surfaces, curves, and edges accurately using CATIA's wireframe modeling capabilities.

Day 14: June 2, 2023

ANSYS Fluent - Steady Flow Analysis: Mr. Jini Raj R and Mr. Suraj S Rao conducted a session on the importance of studying flow analysis through ANSYS Fluent, a widely used computational fluid dynamics (CFD) software. Participants learned how to set up fluid flow simulations, define boundary conditions, analyze results, and interpret data for engineering applications. The session provided valuable insights into understanding and predicting fluid behavior.

Day 15: June 3, 2023

ANSYS Fluent - External Flow Analysis: Continuing with ANSYS Fluent, Mr. Jini Raj R and Mr. Suraj S Rao focused on external flow analysis. Participants gained practical experience in simulating and analyzing the flow of fluids around external objects, such as airfoils and bodies. This session enhanced participants' understanding of aerodynamic principles and their application in real-world scenarios.