BMEE306P	**Computer Aided Design and Finite Element Analysis Lab**	**L**	**T**	**P**	**C**
		0	**0**	**2**	**1**
Pre-requisite	**BMEE202L, BMEE202P**	**Syllabus version**			
		1.0			

Course Objectives

1. To enable the student's skills in CAD and FEM software that can be used and implemented for various engineering applications.
2. To develop proficiency in the application of the finite element method (modelling, analysis, and interpretation of results) to realistic engineering problems.

Course Outcomes

At the end of the course, the student will be able to

1. Create CAD and FE models for trusses, frames, plate structures, machine parts, and engineering components using general-purpose CAD and FE software.
2. Evaluate and interpret the results of FEA analysis of engineering problems.

Indicative Experiments		
1.	Parametric modelling – Curves, solids and surfaces	6 hours
2.	Importing and exporting the CAD models to analysis software	2 hours
3.	Analysis of loading and stress distribution in a simple & stepped bar with different cross section area and analysis of a 2D Truss structure	6 hours
4.	Analysis of beam deflection under different types of loading	4 hours
5.	Analysis of stress on a flat plate with a hole at its centre	2 hours
6.	Heat transfer analysis using pure conduction and heat generation.	2 hours
7.	Axis-symmetric analysis	2 hours
8.	Determining the natural frequencies and mode shapes for simple structure	2 hours
9.	Perform harmonic analysis on simple structure and plot the frequency response function.	2 hours
10	Analysis of a 3D model	2 hours
	Total Laboratory Hours	**30 hours**

Text Books	
1	Ibrahim Zeid, "Mastering CAD/CAM", 2013, McGraw Hill Education (India) P Ltd., SIE.
2	Rao S. S., Finite Element Method in Engineering, 2010, 5th edition, Butterworth-Heinemann.
3	Lab Manual of prepared by course faculty members

Reference Books	
1.	Saeed Moaveni, Finite Element Analysis, Theory and Application with ANSYS, 2021, Pearson Fifth Edition.
2.	Tirupathi R. Chandrupatla and Ashok D. Belugundu, Introduction to Finite Elements in Engineering, 2011, 4th Edition, Prentice Hall.
3.	Seshu. P, Finite Element Analysis, 2013, Prentice Hall of India.
4.	Reddy J.N, Introduction to Finite Element Method, 2019, McGraw -Hill International Edition.

Mode of assessment: Continuous assessment, FAT, Oral examination			
Recommended by Board of Studies	09-03-2022		
Approved by Academic Council	No. 65	Date	17-03-2022