Department: Mechanical Engineering A.Y. 2023-24 Semester: II Date:27/12/2023

Ref No:

Course Outline

Class: TY B Tech	**Name of the Course: Model based System Engineering**			
Course Type: OEC - IV	**Course code: BME6604A**			
	Examination Structure			
Credits: 03	IE	MTE	ETE	Total
	20	30	50	100

Course Relevance: MBSE, or Model-Based Systems Engineering, is an approach to system engineering that emphasizes the use of models to define and design complex systems. Modern systems, whether they are in aerospace, automotive, healthcare, or other industries, have become increasingly complex. MBSE provides a structured way to model and manage this complexity, enabling engineers to understand, analyze, and design intricate systems more effectively.
Systems engineering involves collaboration between various disciplines, such as mechanical, electrical, and software engineering. MBSE facilitates better communication and collaboration by providing a common language and a shared understanding through visual models.

Pre requisites: Not Required

Course Outcome and Mapping with POs and PSOs

CO	Statement	Learning Level	PO/ PSO Mapped	Tools for direct Assessment
1	**DESCRIBE** the methods, Processes and practices of systems engineering.	2	PO1	IE1, MTE, ETE
2	**UNDERSTAND** Fundamentals of systems and subsystems.	2	PO1, PO5	IE1, MTE, ETE
3	**DIFFERENTIATE** between traditional document-based and model-based systems engineering.	2	PO1	MTE, ETE
4	**ANALYZE** three pillars of MBSE: languages, methods, and tools.	4	PO1, PO2	IE2, ETE
5	**CREATE** models and diagrams using modelling language.	4	PO1, PO2, PO5	IE2, ETE
6	**APPLY** Model Based Systems Engineering (MBSE) approach to Engineering problems.	4	PO1, PO2	IE2, ETE

Internal Evaluation

CO	Statement	IE 1 Planning	IE 2 Planning
	Weightages		
1	**DESCRIBE** the methods, Processes and practices of systems engineering.	Assignment on real life complex system and stakeholder identification and drawing hierarchy and context diagram using SysML tool	
2	**UNDERSTAND** Fundamentals of systems and subsystems.		
3	**DIFFERENTIATE** between traditional document-based and model-based systems engineering.		Assignment on creating models and

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4	**ANALYZE** three pillars of MBSE: languages, methods, and tools.		diagrams using SysML tool
5	**CREATE** models and diagrams using modelling language.		
6	**APPLY** Model Based Systems Engineering (MBSE) approach to Engineering problems.		

Rubric for the assessment of IE1 and IE 2

Parameter/ Marks	8-10	5-7	2-4	0-1
Knowledge	Covers the complete scope and submits an activity with appropriate work with clear understanding	Covers the complete scope and submits an activity with appropriate work without complete clarity	Covers the scope partially and submits an activity with appropriate work without clarity	Covers the scope partially and submits an activity without appropriate work without clarity
Presentation (Skill)	Presents with clarity and answers all the questions asked	Presents with clarity and answers almost all the questions asked	Presents without clarity and answers a few questions asked	Presents without clarity and fails to answers the questions asked
Timely Submission (Attitude)	Followed the submission time line	Late by one day	Late by two days	Late by one week

Teaching Plan for Theory Sessions

CO/PO	PO1	PO2	PO5	
1	8			8
2	6	2		8
3	7			7
4	6	2		8
5	4	3		7
6	5	2		7
	36	9		45

Marks distribution

CO	IE1	IE2	MTE	ETE	Total
Out of	20	20	50	80	
Converted to	10	10	30	50	
1	10		15	4	29
2	10		15	4	29
3			20	8	28
4		10		18	28
5		10		18	28
6				28	28
	20	20	50	80	170

Dr. A. Francis
Course Faculty

Mr. A. S. Kashid
Course Faculty and Course Coordinator