Program Articulation Matrix

S#	Cat	Course	CO	CO Description	PO1	PO2	PO3	PO4	PO5	PO6	PO7
1	ESC	23MT5102 - CTEO	CO1	Understand the fundamental concepts of optimization, including types of problems, mathematical formulation, and programming implementation.	3	3					
2	ESC	23MT5102 - CTEO	CO2	Apply mathematical optimization techniques, both unconstrained and constrained, to solve engineering problems using programming languages like Matlab/Python/R.	3				3		
3	ESC	23MT5102 - CTEO	CO3	Analyze and solve multi-objective optimization problems, considering trade-offs and conflicting objectives, using appropriate algorithms and methodologies.	3				3		
4	ESC	23MT5102 - CTEO	CO4	Apply optimization techniques to solve application-specific problems in Machine Design and Thermal Engineering domains, demonstrating domain-specific knowledge and skills.	3				3		
5	PCC	23MD5102 - RMDA	CO1	Apply homogeneous transformations and DH parameters	2		2	2			
6	PCC	23MD5102 - RMDA	CO2	Apply forward and inverse kinematics to Robots		2	2	2			
7	PCC	23MD5102 - RMDA	CO3	Apply rigid body dynamics and dynamic modelling to Robots		2	2	2			
8	PCC	23MD5102 - RMDA	CO4	Design mechanical systems for robot manipulators		3	2	2			
9	PCC	23MD5102 - RMDA	CO5	Apply configuration space and motion planning		2	2	2			
10	PCC	23MD5103 - MBM	CO1	Analyze the structural deformation of solid bodies in multi-axial stress state to assess the safety factor against yielding	2		1				

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11	PCC	23MD5103 - MBM	CO2	Solve 2-D elasticity problems in Cartesian and Polar coordinate systems		2	1				
12	PCC	23MD5103 - MBM	CO3	Analyze the bending of cantilever beams having rectangular and circular cross-sections; Axisymmetric stress and deformation in a solid of revolution ; and simple 3-D stress analysis problems	2		1				
13	PCC	23MD5103 - MBM	CO4	Analyze the plastic deformation of solid bodies using the method of characteristics and engineering methods	2		1				
14	PCC	23MD5103 - MBM	CO5	Analyze the complex structural deformation problems relevant to CO1, CO2, CO3 and CO4		2	1				
15	PCC	23MD5106 - MAME	CO1	Understand various CAD tools and peripherals required to create models.	2	2		2			
16	PCC	23MD5106 - MAME	CO2	Represent different curves and surfaces of geometric models.	2	2		2			
17	PCC	23MD5106 - MAME	CO3	Represent solid models using different solid represent schemes	2	2		2			
18	PCC	23MD5106 - MAME	CO4	Apply various data exchange formats in geometric modeling and also will be able to apply finite element modeling and mechanical assembly concepts in design applications	2	2		2			
19	PCC	23MD5106 - MAME	CO5	Analyze various mechanical elements models using modeling software	2	2		2			
20	PCC	23MD5106 - MAME	CO6	Design and develop mechanical components for selected applications	2	2		2			
21	PCC	23MD5204 - ASM	CO1	Analyze the stresses and deflections in the beams under unsymmetrical bending and determination of shear centre.		2					

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22	PCC	23MD5204 - ASM	CO2	Analyze the stresses induced in curved beams subjected to loading.	2	2					
23	PCC	23MD5204 - ASM	CO3	Analyze the torsional stresses in beams and determine the contact stresses.	2	2					
24	PCC	23MD5204 - ASM	CO4	Apply principles of elasticity to determine stresses in two dimensional and three dimensional problems.		2					
25	PCC	23MD5204 - ASM	CO5	Simulate the structural members using ANSYS software and validate the results with analytical methods	2	2					
26	PCC	23MD5205 - MV	CO1	Analyse free vibrations of single degree freedom systems	3		3	3			
27	PCC	23MD5205 - MV	CO2	Analyse harmonically excited vibrations of single degree freedom systems	3		3	3			
28	PCC	23MD5205 - MV	CO3	Analyse the mode shapes of two degree and multi degree vibration systems	3		3	3			
29	PCC	23MD5205 - MV	CO4	Identify the means to control and measure the vibration response of the system	3		3	3			
30	PCC	23MD5205 - MV	CO5	Analyse the vibrations of the system using analysis software	3		3	3			
31	PRI	23IE5149 - TP	CO1	Understand Literature Review and Problem Identification	1	2		2			
32	PRI	23IE5149 - TP	CO2	Understand Methodology and Implementation	1	2		2			
33	PRI	23IE5201 - ERD	CO1	Analyze existing research to identify a focused and answerable research question or develop a well-defined hypothesis	2	3					
34	PRI	23IE5201 - ERD	CO2	Evaluate different research designs based on their strengths and weaknesses in relation to the chosen research question and data needs.		3					3

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35	PRI	23IE5201 - ERD	CO3	Apply appropriate data collection methods considering the chosen research design and data characteristics.	2		2				
36	PRI	23IE5201 - ERD	CO4	Analyze and interpret data using relevant data analysis methods to address the research question			3				2
37	PRI	23IE6150 - DIS	CO1	Identify and articulate research problems within their field of study, demonstrating an understanding of current research gaps.	2		2				
38	PRI	23IE6150 - DIS	CO2	Design and execute research methodologies, employing relevant techniques for data collection, analysis, and interpretation.				2		2	
39	PRI	23IE6150 - DIS	CO3	Demonstrate advanced critical thinking skills, analyzing research findings within the context of existing literature to draw meaningful conclusions.	2		2				
40	PRI	23IE6250 - DIS	CO1	Demonstrate a comprehensive understanding of a chosen research topic and its significance in the broader field.	2					2	
41	PRI	23IE6250 - DIS	CO2	Apply appropriate research methodologies to address research questions		2			2		
42	PRI	23IE6250 - DIS	CO3	Analyze and interpret data effectively, drawing meaningful conclusions	2					2	
					2.2	2.2	2.1	2.3	2.8	2	2.5