

**MANAV RACHNA UNIVERSITY**

**DEPARTMENT OF MECHANICAL ENGINEERING**

**M.Tech MECHANICAL Engineering Mapping of COs with POs and PSOs**

SEMESTER-1																			
Courses Code	Courses	Course Outcomes	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
MEH501-T	MODERN MANUFACTURING PROCESSES	CO1	To categorized the various unconventional manufacturing process based on energy sources and mechanism employed	3	2	2	3	3	3	3	2	2	1	1	1	2	3	3	
		CO2	To select the best suitable advanced manufacturing process for processing of unconventional materials employed in modern manufacturing industries	3	2	2	2	1	2	3	1	2	2	2	2	3	2	3	3
		CO3	To study the parametric influences during processing of materials using developed models	3	2	1	1	1	3	3	3	2	2	1	2	1	2	2	2
		CO4	To analysis the MRR and TWR during optimization of modern machining process	3	3	2	2	1	2	2	2	1	1	1	1	3	1	2	2
MEH502-T	PRODUCTION SYSTEM & MANAGEMENT	CO1	To understand the concept of production system used in industries	3	2	2	3	1	3	3	2	2	3	1	3	2	2	2	
		CO2	To learn the different production concepts and philosophies.	2	2	3	2	1	2	3	1	3	2	2	3	3	3	1	
		CO3	To know their role in industry for smooth and efficient functioning of respective industry	3	3	1	1	1	3	3	2	3	3	2	3	3	3	2	2
		CO4	To study important concepts such as key performance indicators, productivity, flexibility and quality in a production context	3	1	1	3	3	1	2	2	1	3	1	3	1	1	1	1
MEH503-T	METAL FORMING ANALYSIS	CO1	To solve the numerical problems to calculate stresses on inclined planes.	3	2	2	3	1	3	3	2	2	3	1	2	2	2		
		CO2	To apply theory of failure for the hot working and cold working process	2	2	3	2	1	3	3	1	3	2	2	3	3	3	3	
		CO3	Estimate the working loads for pressing, forging, wire drawing etc. processes.	2	2	1	1	1	1	3	2	3	3	2	3	2	2	2	
		CO4	To study and analyse the sheet metal operation including punch and die operations	2	1	1	1	1	2	2	1	1	3	3	3	1	2	2	
MEH504/ MEH505	Work Measurement Techniques	CO1	Apply the theorem of motion and work study method in the industrial problems	3	2	2			2		1	3	2			1	2	1	
		CO2	Calculate required data of any work system.	2	1		1	1				2			1		1	1	
		CO3	design an economic work system, process and proper utilisation of equipments.	2	1						1		2			1			
PHS501	RESEARCH METHODOLOGY	CO1	write hypothesis; generate and choose alternatives; and test hypothesis	3	3	2	1	1	1	2	2	2	3	2	3	3			
		CO2	select a sample; generate data and present it	3	2	1	1	1	1	2	2	2	2	3	2	3	3		
		CO3	Calculate averages and dispersion	3	2	1	1	1	1	2	2	2	2	2	3	3	3		
		CO4	Calculate correlation and regression	3	3	1	1	1	1	2	2	2	2	3	3	3	3		
MEW506	WORKSHOP	CO1	To perform the basics of metal machining and mechanics of metal machining	3	2	2	3	1	3	3	2	2	3	1	3	2	2		
		CO2	To study the different cutting tool materials and types & geometry of cutting tools	2	2	3	2	1	2	3	1	3	2	2	3	3	3	3	
		CO3	To learn introductory concepts of various advanced machining processes	3	3	1	1	1	3	3	2	3	3	2	3	3	3	2	
		CO4	To learn the difference mechanism on conventional and non-conventional machining process	3	1	1	3	3	1	2	2	1	3	1	3		1	1	
<b>Total</b>				<b>62</b>	<b>46</b>	<b>35</b>	<b>38</b>	<b>27</b>	<b>43</b>	<b>53</b>	<b>37</b>	<b>47</b>	<b>50</b>	<b>37</b>	<b>56</b>	<b>47</b>	<b>38</b>	<b>17</b>	

SEMESTER-2																				
Courses Code	Courses	Course Outcomes	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
MEH507-T	PRODUCTION ERGONOMICS & WORK PLACE DESIGN	CO1	Understand the different types of energy expenditure.	3			1	1	2		1	3		1	1	2				
		CO2	Develop competency in designing of ergonomically correct work place.	2		1			1				2	1	1					
		CO3	Select Suitable rest & break and working conditions		2		1				1		11		1		1	1	1	
MEH508-T	WELDING & ALLIED PROCESSES	CO1	Able to understand the weld in different positions using the welding methods	3	2	2	3	1	3	3	3	2	3	1	3	2	2			
		CO2	Understanding of the safety actions that must be taken to ensure that no one is injured during the welding.	3	3	2	2	1	2	1	1	1	3	2	2	3		2	2	
		CO3	To solve the problems related to duty cycle arc welding power sources	3	2	1	1	1	1	3	3	3	2	1	3	3	1			
		CO4	To evaluate the arc length and melting efficiency for welding processes	3	1	1	1	2	2	3	1	1	1	1	1	3	1	2		
MEH509/ MEH510	Rapid Prototyping	CO1	Describe product development, conceptual design and classify rapid prototyping systems	2	3	1	2	3	1	3	2	1	2	3	1	2	3	1		
		CO2	Explain direct metal laser sintering, LOM and fusion deposition modeling processes.	1	2	3	1	2	3	2	1	3	2	1	3	2	1	3		
		CO3	Demonstrate solid ground curing principle and process	3	1	2	3	1	2	3	1	3	2	1	3	2	1	3		
		CO4	Discuss LENS, BPM processes; point out the application of RP system in medical field define virtual prototyping and identify simulation components.	1	3	2	1	3	2	1	3	2	1	3	2	3	1	2		
MEH511/ MEH512	CIM	CO1	Understand the different types of application of CIM	3	2	2	3	1	3	3	2	2	3	1	3	2	2			
		CO2	Construct part programmes using different format for given simple problem	3	2	2	2	1	2	3	1	2	2	2	3	2	2			
		CO3	Develop an FMS (Flexible Manufacturing System) layout for given simple part family, using group technology concepts and familiarize with computer aided process planning	2	2	1	1	1	3	3	2	2	3	2	3			2	2	
		CO4	Recognize use of robotics, in the field of manufacturing	2	1	1	1	1	2	2	2	1	1	3	1	3	1	2		
MES515	RESEARCH PAPER WRITING /SEMINAR	CO1	To address the problem context, research question, hypotheses based on setting context with the current literature planned research methodology	3	3	2	2	3	3	3	2	2	2	2	2	3	3	1		
		CO2	To design and develop a technical research paper by keeping in view of the problem statements	3	3	2	2	3	3	3	2	2	2	2	2	2	3	3	1	
MEW513	WORKSHOP (CNC PROGRAMMING)	CO1	Use an understanding of general and machine (G & M) code to generate or edit a program which will operate a CNC lathe.	3	2	2	3	2	3	3	3	2	3	2	3		3	3		
		CO2	Prepare part programmes using ISO format for given simple components	3	2	2	2	1	2	3	3	1	2	2	2	3	2	2		
		CO3	Identify different axes, machine zero, home position, systems and controls CNC machines.	3	2	1	1	2	3	3	2	2	3	3	3			2	1	
		CO4	Apply maintenance practices for CNC machines	3	1	2	1	3	2	2	2	1	1	3	1	3	1	2		
MEN514	SEMINAR (PROBLEM IDENTIFICATION & LITERATURE REVIEW)	CO1	Identification of the problem, related question, setting context with the current literature review.	3	1	2	1	3	2	3	2	2	2	2	2	3	3	1		
		CO2	To design and develop a technical research paper related with the problem statements	3	1	2	1	3	1	2	1	2	2	2	2	2	3	3	1	
<b>Total</b>				<b>58</b>	<b>41</b>	<b>36</b>	<b>36</b>	<b>39</b>	<b>48</b>	<b>53</b>	<b>36</b>	<b>54</b>	<b>47</b>	<b>37</b>	<b>54</b>	<b>46</b>	<b>44</b>	<b>14</b>		

SEMESTER-3																			
Courses Code	Courses	Course Outcomes	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
MEH616-T	THEORY OF METAL CUTTING	CO1	Understand mechanism of metal cutting, Chip formation, Orthogonal and Oblique cutting	3	3	2	2	2	2	2	1	2	2	2	3	3		3	
		CO2	Analyze basic parameters of metal- cutting operation & optimize the machining process to satisfy the required conditions.	3	3	3	2	1	2	2	1	2	2	2	2	3	3		3
		CO3	Apply Taylor's tool life relationship for calculating cutting parameters	3	3	2	1	2	2	2	2	1	2	2	2	3	3		3
		CO4	differentiate between cutting tools materials and cutting fluids with their applications	3	3	3	2	2	2	2	2	1	2	2	2	3	3		3
MEH605B-T	GLOBAL LOGISTICS SYSTEM	CO1	State the factors influencing global market forces and the factors influencing technological forces.	3	2	2	3	1	3	3	2	2	3	1	3		2	2	2
		CO2	Identify the sources of risks and Outline the management of global risks.	2	2	3	2	1	2	3	1	3	2	2	3	3	3	3	1
		CO3	List the issues in international supply chain management and Clarify the regional and cultural differences in logistics.	3	3	1	1	1	3	3	2	3	3	2	3		3	2	2
		CO4	Elaborate the requirements of global strategy and strategy implementation.	3	1	1	3	3	1	2	2	1	3	1	3	1	1	1	1
MEH617-T	ADVANCED OPTIMISATION TECHNIQUES	CO1	Understand the basic theory and some advanced topics in linear optimization, integer optimization, and convex optimization	3	3	2	1	2	2	2	1	2	2	2	3	3		3	
		CO2	Identify the proper optimization technique(s) to attempt when problems are too large or too complicated to solve in a straightforward way	3	3	3	2	2	2	2	1	2	2	2	2	3	3		3
		CO3	Use optimization software and implement solution algorithms involving largescale optimization techniques	3	3	2	2	2	2	2	1	2	2	2	2	3	3		3
		CO4	Handle large data sets that accompany real-world optimization problems.	3	3	3	2	1	2	2	1	2	2	2	2	3	3		3
MEH604B-T	MACHINE TOOL DESIGN	CO1	Understand basic motions involved in a machine tool.	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	
		CO2	Design machine tool structures.	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	
		CO3	Design and analyze systems for specified speeds and feeds.	2	3	1	3	2	1	3	2	1	3	2	1	3	2	1	
		CO4	Apply appropriate quality tests for quality assurance.	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	
MES624	RESEARCH PAPER WRITING/ SEMINAR	CO1	To address the problem context, research question, hypotheses based on setting context with the current literature planned research methodology	3	3	2	2	3	3	3	2	2	2	2	2	3	3	1	
		CO2	To design and develop a technical research paper by keeping in view of the problem statements	3	3	2	2	3	3	3	2	2	2	2	2	2	3	3	1
<b>Total</b>				<b>49</b>	<b>46</b>	<b>39</b>	<b>36</b>	<b>33</b>	<b>39</b>	<b>42</b>	<b>26</b>	<b>37</b>	<b>40</b>	<b>33</b>	<b>48</b>	<b>48</b>	<b>21</b>	<b>40</b>	

SEMESTER-4																			
Courses Code	Courses	Course Outcomes	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
MEH626-T	LEAN MANUFACTURING	CO1	To Understand basic of Lean manufacturing	3	2					2	2	2	2	1	2	2		3	
		CO2	To apply Lean Manufacturing Tools and Methodologies	3	2					2	2	2	2	1	2	3			3
		CO3	To apply just in time manufacturing in automation	3	2					2	2	2	2	1	2	3			3
		CO4	To compare Six Sigma, Lean and ERP technique in industry	3	2					3	2	2	2	2	2	3			3
MEN629	DISSERTATION WORK	CO1	to use a holistic view to critically, independently and creatively identify, formulate and deal with complex issues.	2	2	2	2	3	3	3	3	3	2	2	3	3	3	1	
		CO2	present and discuss the conclusions as well as the knowledge and arguments that form the basis for these findings in written and spoken English.	2	2	2	2	3	3	3	3	3	3	2	2	3	3	3	1
		CO3	identify the issues that must be addressed within the framework of the specific thesis in order to take into consideration all relevant dimensions of sustainable development.	2	2	2	2	3	3	3	3	3	3	2	2	3	3	3	1
		CO4	A consciousness of the ethical aspects of research and development work.	2	2	2	2	3	3	3	3	3	3	2	2	3	3	3	1
<b>Total</b>				<b>20</b>	<b>16</b>	<b>8</b>	<b>8</b>	<b>12</b>	<b>12</b>	<b>21</b>	<b>20</b>	<b>20</b>	<b>16</b>	<b>13</b>	<b>20</b>	<b>23</b>	<b>12</b>	<b>16</b>	
<b>OVERALL TOTAL</b>				189	149	118	118	111	142	169	119	158	153	120	178	164	115	87	