

**DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

Program Code : **XXX M.Tech. (CAD, CAM and Robotics)**  
 Department : **Department of Mechanical and Industrial Engineering**  
 Year : **I**  
 Model : **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
<b>Semester-I (Autumn)</b>									
1.	MIC-501	Measurements and Instrumentation	PCC	4	3	0	2	3	0
2.	MIC-503	Finite Element Methods	PCC	4	3	0	2	3	0
3.	MIC-505	Numerical Methods for Engineers	PCC	4	3	1	0	3	0
4.	MIC-507	Continuum Mechanics	PCC	4	3	1	0	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		<b>Total</b>		<b>18</b>					
<b>Semester-II (Spring)</b>									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	MIC-700	Seminar	SEM	2	-	-	-	-	-
		<b>Total</b>		<b>21</b>					

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Program Code : **XXX M.Tech. (CAD, CAM and Robotics)**  
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 Year : **II**  
 Model : **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
<b>Semester-I (Autumn)</b>									
1.	MIC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	MIC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		<b>Total</b>		<b>13</b>					
<b>Semester-II (Spring)</b>									
1.	MIC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		<b>Total</b>		<b>14</b>					

<b>Summary</b>				
Semester	1	2	3	4
<b>Semester-wise Total Credits</b>	18	21	13	14
<b>Total Credits</b>	<b>66</b>			

**M.Tech. (CAD, CAM and Robotics)**

**Program Elective Courses**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIL-621	Instrumentation and Experimental Methods	PEC	4	3	1	2/2	3	0
2.	MIL-503	Computer Aided Manufacturing	PEC	4	3	1	0	3	0
3.	MIL-502	Robotics and Control	PEC	4	3	1	2/2	3	0
4.	MIL-508	Advanced Automatic Control	PEC	4	3	1	0	3	0
5.	MIL-509	Extended Finite Element Methods	PEC	4	3	1	0	3	0
6.	MIL-515	Manufacturing System Analysis	PEC	4	3	1	0	3	0
7.	MIL-516	Artificial Intelligence	PEC	4	3	1	0	3	0
8.	MIL-517	Automated Materials Handling Systems	PEC	4	3	1	0	3	0
9.	MIL-527	Computational Fluid Dynamics & Heat Transfer	PEC	4	3	1	0	3	0
10.	MIL-547	Product and Process Optimization	PEC	4	3	1	0	3	0
11.	MIL-550	Advanced Machine Design	PEC	4	3	1	0	3	0
12.	MIL-551	Dynamics of Mechanical Systems	PEC	4	3	1	0	3	0
13.	MIL-552	Advanced Mechanics of Solids	PEC	4	3	1	0	3	0
14.	MIL-554	Computer Aided Mechanism Design	PEC	4	3	1	2/2	3	0
15.	MIL-557	Finite Element Methods	PEC	4	3	1	0	3	0
16.	MIL-558	Fracture Mechanics	PEC	4	3	1	0	3	0
17.	MIL-559	Computer Aided Design	PEC	4	3	1	2/2	3	0
18.	MIL-560	Mechanics of Composite Materials	PEC	4	3	1	0	3	0
19.	MIL-561	Advanced Mechanical Vibrations	PEC	4	3	1	2/2	3	0
20.	MIL-563	Mechatronics	PEC	4	3	1	2/2	3	0
21.	MIL-565	Smart Materials, Structures, and Devices	PEC	4	3	1	0	3	0
22.	MIL-566	Computer Aided Analysis of Mechanical Systems	PEC	4	3	1	0	3	0
23.	MIL-567	Computer Graphics	PEC	4	3	1	2/2	3	0
24.	MIL-568	Advanced Robotics	PEC	4	3	1	2/2	3	0

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**Program Elective Courses**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
25.	MIL-504	Mechanics of Soft Materials	PEC	4	3	1	0	3	0
26.	MIL-505	Statistical Machine Learning	PEC	4	3	1	0	3	0
27.	MIL-506	Elastic Waves in Solids	PEC	4	3	1	0	3	0
28.	MIL-507	Isogeometric Analysis	PEC	4	3	1	2	3	0
29.	MIL-510	Shock Phenomena	PEC	4	3	1	0	3	0
30.	MIL-511	Materials Behaviors under Extreme Conditions	PEC	4	3	1	0	3	0
31.	MIL-512	Introduction to Biomechanics	PEC	4	3	1	2/2	3	0
32.	MIL-513	Impact Mechanics	PEC	4	3	1	2/2	3	0
33.	MIL-417	Energy and Variational Principles in Engineering Mechanics	PEC	4	3	1	0	3	0
34.	MIL-608	Fatigue in Structures & Materials	PEC	4	3	1	2/2	3	0
<b>Students should mandatorily earn a minimum of 3 credits from practical components in a program.                  These practical components can be part of a course or a dedicated practical /laboratory course.</b>									

**Science, Technology, and Advanced Research-tools Basket**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIT-501	Value Engineering	STAR	3	2	1	0	3	0