

**CURRICULUM**  
**M.TECH. MECHANICAL ENGINEERING (MACHINE DESIGN & ROBOTICS)**  
**CHOICE BASED CREDIT SYSTEM**

**STUDENTS LEARNING OUTCOMES**

The curriculum and syllabi for M.Tech Mechanical Engineering program (Machine Design & Robotics) (2017-18) conform to Outcome Based Education (OBE) for a flexible and structured Choice Based Credit System (CBCS). In general, **ELEVEN STUDENT OUTCOMES** (a-k) have been identified and the curriculum and syllabi have been chosen in such a way that each of the modules meets one or more of these outcomes. Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program. Further, each module in the program spells out clear instructional objectives which are mapped to the student outcomes.

**The Student Outcomes are:**

- (a) Ability to apply knowledge of Mathematics and science in machine design & robotics solutions.
- (b) Ability to understand the engineering concepts and their applications using the acquired broad based knowledge.
- (c) Ability to design and develop problems related to machine design.
- (d) Ability to use the techniques, skills, and modern engineering tools necessary for software and hardware practices.
- (e) Ability to identify and analyze problems in related multiple disciplines including design development, robotics, automation and manufacturing.
- (f) Ability to design, develop and verify a mechanical system to meet desired needs ensuring its reliability and security in addition to satisfying economic, social and ethical constraints.
- (g) Ability to apply Enterprise level application software for design of engineering product/process.
- (h) Ability to function as consultant for the development of sustainable software solutions.
- (i) An understanding of professional and ethical values.
- (j) Ability to communicate effectively in diverse groups and exhibit leadership skills.
- (k) To develop an understanding of global environment and its protection.

**M. TECH MECHANICAL ENGINEERING (Machine Design & Robotics)**  
**SUMMARY OF PROGRAM CURRICULUM**

<b>Category</b>	<b>Total Number of Credits (M.Tech)</b>	<b>Percentage of Total credits</b>
Program Core (PC)	44	59
Program Elective (PE)	8	11
Generic Elective (GE)	8	11
Seminar & Special Problem (SP)	2	3
Dissertation (DI)	12	16
	<b>74</b>	

**PROGRAM SCHEME**

**SEMESTER - I**

MODULE CODE	CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
MECH5101	PC	MECHANICAL BEHAVIOUR OF MATERIALS	3	1	0	3.5	50	100	150
MECH5102	PC	ARTIFICIAL INTELLIGENCE	4	0	0	4	50	100	150
MECH5103	PC	EXPERIMENTAL STRESS ANALYSIS	3	1	0	3.5	50	100	150
MECH5104	PC	EXPERIMENTAL STRESS ANALYSIS LAB	0	0	2	1	25	25	50
MECH5105	PC	COMPUTER INTEGRATED MANUFACTURING	4	0	0	4	50	100	150
MECH5106	SP	SPECIAL PROBLEM	0	0	2	1	25	25	50
	GE	ELECTIVE-A	4	0	0	4	50	100	150
<b>TOTAL</b>			<b>18</b>	<b>2</b>	<b>4</b>	<b>21</b>	<b>300</b>	<b>550</b>	<b>850</b>

L = Lecture  
 T = Tutorial  
 P = Practical  
 C = Credit Point

MODULE CODE	GENERIC ELECTIVE - A
SAPA0320	SAP (ABAP) <sup>ψ</sup>
SAPM0321	SAP (MM) <sup>ψ</sup>
SAPS0322	SAP (SD) <sup>ψ</sup>
SAPH0323	SAP (HCM) <sup>ψ</sup>
SAPF0324	SAP (FI) <sup>ψ</sup>
CCNA0325	CCNA <sup>ψ</sup>
MATH0302	NUMERICAL ANALYSIS & OPTIMISATION

<sup>ψ</sup>Additional fee, if any, shall be borne by the student.

**SEMESTER - II**

MODULE CODE	CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
MECH5107	PC	FINITE ELEMENT METHOD	4	0	0	4	50	100	150
MECH5108	PC	PRINCIPLE OF MACHINE DESIGN	3	0	0	3	25	75	100
MECH5109	PC	PRINCIPLE OF MACHINE DESIGN LAB	0	0	2	1	25	25	50
MECH5110	PC	ROBOTICS & AUTOMATION	4	0	0	4	50	100	150
MECH5111	SP	SEMINAR	0	0	2	1	25	25	50
RESM0101	PC	RESEARCH METHODOLOGY	4	0	0	4	50	100	150
	PE	ELECTIVE-I	4	0	0	4	50	100	150
<b>TOTAL</b>			<b>19</b>	<b>0</b>	<b>4</b>	<b>21</b>	<b>275</b>	<b>525</b>	<b>800</b>

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ELECTIVES	
MODULE CODE	PROGRAM ELECTIVE I
MECH5212	DYNAMIC OF ROAD VEHICLE
MECH5213	FRACTURE MECHANICS

### SEMESTER - III

MODULE CODE	CATEGORY	MODULE	L	T	P	C	INTERNAL MARKS	EXTERNAL MARKS	TOTAL
MECH6101	PC	ROBOTIC SENSORS	4	0	0	4	50	100	150
MECH6102	PC	THEORY OF ELASTICITY	4	0	0	4	50	100	150
MECH6103	PC	MECHANICAL VIBRATIONS	3	0	0	3	25	75	100
MECH6104	PC	MECHANICAL VIBRATIONS LAB	0	0	2	1	25	25	50
MECH6105	DI	LITERATURE SURVEY (DISSERTATION STAGE 1)*	0	0	0	2	50	50	100
	PE	ELECTIVE-II	4	0	0	4	50	100	150
	GE	ELECTIVE- B	4	0	0	4	50	100	150
<b>TOTAL</b>			<b>19</b>	<b>0</b>	<b>2</b>	<b>22</b>	<b>300</b>	<b>550</b>	<b>850</b>

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#### ELECTIVES

MODULE	PROGRAM ELECTIVE II
MECH6206	INDUSTRIAL TRIBOLOGY
MECH6207	TOTAL QUALITY MANAGEMENT
MODULE CODE	GENERIC ELECTIVE B
SAPA0320	SAP (ABAP) <sup>ψ</sup>
SAPM0321	SAP (MM) <sup>ψ</sup>
SAPS0322	SAP (SD) <sup>ψ</sup>
SAPH0323	SAP (HCM) <sup>ψ</sup>
SAPF0324	SAP (FI) <sup>ψ</sup>
CCNA0325	CCNA <sup>ψ</sup>
MGMT0306	ORGANISATIONAL BEHAVIOUR

<sup>ψ</sup> Additional fee, if any, shall be borne by the student.

\* Students are to earn 2 credits on review of literature in 3rd semester out of 12 credits in total assigned to dissertation, to be completed in 4th semester.

### SEMESTER - IV

MODULE CODE	CATEGORY	MODULE	L	T	P	C	EXTERNAL MARKS	INTERNAL MARKS	TOTAL
MECH6108	DI	DISSERTATION and VIVA (DISSERTATION STAGE 2)	-	-	-	10	250	250	500
<b>TOTAL</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>250</b>	<b>250</b>	<b>500</b>

L = Lecture

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