



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

## **B. Tech - Mechanical Engineering Course Structure (R24) Applicable From 2024-25 Admitted Batch Structure Breakup**

S.No	Category	Breakup of credits (Total 160 credits)
1	Humanities and Social Sciences including Management courses (HSMC)	7
2	Basic Sciences Courses (BS)	24
3	Engineering Sciences courses including Workshop, Drawing basics of electrical/mechanical/computer etc.(ES)	26
4	Professional Core courses (PC)	59
5	Professional Electives (PE)	18
6	Open Electives (OE)	9
7	Project work, Seminar and Internship in industry or elsewhere (PS)	17
		0
8	Mandatory Courses	
	<b>TOTAL</b>	<b>160</b>

## I SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIA)	External (SEE)	Total
		<b>Theory</b>								
1	2410001	Matrices and Calculus	BS	3	1	0	4	40	60	100
2	2410008	Applied Physics	BS	3	0	0	3	40	60	100
3	2410501	Problem Solving using C and C++	ES	3	0	0	3	40	60	100
4	2410010	English for Skill Enhancement	HSMC	3	0	0	3	40	60	100
		<b>Laboratory</b>								
1	2410372	Engineering Workshop	ES	0	1	4	3	40	60	100
2	2410071	Applied Physics Laboratory	BS	0	0	2	1	40	60	100
3	2410571	Problem Solving Using C and C++ Laboratory	ES	0	0	2	1	40	60	100
4	2410073	English Language and Communication Skills Laboratory	HSMC	0	0	2	1	40	60	100
		<b>Skill Development Course</b>								
1	2410596	Web Application Development	SDC	0	0	2	1	40	60	100
		<b>Mandatory Course</b>								
1		Foreign Language	*MC	0	0	0	0	-	-	-
		Induction Programme	-	-	-	-	-	-	-	-
<b>Total Credits</b>				<b>12</b>	<b>2</b>	<b>12</b>	<b>20</b>	<b>360</b>	<b>540</b>	<b>900</b>

### \*MC - Satisfied/Unsatisfied

Students can choose any one of the foreign language from the given list

- i) 24X0FL1 French
- ii) 24X0FL2 German
- iii) 24X0FL3 Spanish
- iv) 24X0FL4 Korean

## II SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIA)	External (SEE)	Total
		<b>Theory</b>								
1	2420002	Differential Equations and Vector Calculus	BS	3	1	0	4	40	60	100
2	2420009	Engineering Chemistry	BS	3	0	0	3	40	60	100
3	2420321	Applied Mechanics	ES	3	0	0	3	40	60	100
4	2420502	Essentials of Problem Solving using Python	ES	3	0	0	3	40	60	100
		<b>Laboratory</b>								
1	2420371	Computer Aided Engineering Graphics	ES	1	0	4	3	40	60	100
2	2420072	Engineering Chemistry Laboratory	BS	0	0	2	1	40	60	100
3	2420373	Fuels& lubricants Laboratory	ES	0	0	2	1	40	60	100
4	2420572	Essentials of Problem Solving Using Python Laboratory	ES	0	0	2	1	40	60	100
		<b>Skill Development Course</b>								
1	2420027	Public Speaking Skills	SDC	0	0	2	1	40	60	100
		<b>Mandatory Course</b>								
1	2420026	Yoga & Inner Engineering	*MC	0	0	0	0	-	-	-
<b>Total Credits</b>				<b>13</b>	<b>1</b>	<b>12</b>	<b>20</b>	<b>360</b>	<b>540</b>	<b>900</b>

\*MC - Satisfied/Unsatisfied

### III SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIA)	External (SEE)	Total
		<b>Theory</b>								
1	2430322	Mechanics of Solids	PC	3	0	0	3	40	60	100
2	2430323	Metallurgy and Material Science	PC	2	0	0	2	40	60	100
3	2430324	Thermodynamics	PC	3	0	0	3	40	60	100
4	2430507	Data Structures	ES	3	0	0	3	40	60	100
5	2430007	Probability, Statistics and Numerical Methods	BS	3	1	0	4	40	60	100
	243ExL1	ExL: Design and Innovation	EL	0	0	2	1	40	60	100
		<b>Laboratory</b>								
1	2430374	Material Science & Mechanics of Solids Laboratory	PC	0	0	2	1	40	60	100
2	2430575	Data Structures Laboratory using Python	ES	0	0	2	1	40	60	100
3	2430375	Computer Aided Machine Drawing Practice	PC	0	0	2	1	40	60	100
1	2430391	Internship - I	*PS	0	0	2	1	100	-	100
		<b>Skill Development Course</b>								
1	2430395	Automotive Design Course - I	SDC	0	0	2	1	40	60	100
		<b>Mandatory Course</b>								
1		Indian Knowledge System	**MC	0	0	0	0	-	-	-
<b>Total Credits</b>				<b>14</b>	<b>1</b>	<b>12</b>	<b>20</b>	<b>500</b>	<b>600</b>	<b>1100</b>

**\*PS – Students have to complete Internship I during the semester break for a minimum of 2 weeks after the second semester.**

**\*\*MC - Satisfied/Unsatisfied**

**Students can choose any one of the following courses**

- 24XIKS1: Indian Science, Engineering and Technology
- 24XIKS2: Fundamentals and Applications of Vedic Mathematics
- 24XIKS3: Indian Health, Wellness and Psychology- including Ayurved
- 24XIKS4: Indian Town Planning and Architecture

#### IV SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIA)	External (SEE)	Total
		<b>Theory</b>								
1	2440202	Basic Electrical and Electronic Engineering	HS	2	0	0	2	40	60	100
2	2440325	Manufacturing Process	PC	3	0	0	3	40	60	100
3	2440326	Theory of Machines	PC	3	0	0	3	40	60	100
4	2440327	Thermal Engineering - I	PC	3	0	0	3	40	60	100
5	2440328	Mechanics of Fluids and Hydraulic Machinery	PC	3	1	0	4	40	60	100
6	244EXL2	ExL: Prototype / Model Development and Entrepreneurship	EL	0	0	2	1	40	60	100
		<b>Laboratory</b>								
1	2440376	Mechanics of Fluids and Hydraulic Machinery Laboratory	PC	0	0	2	1	40	60	100
2	2440377	Manufacturing Process Laboratory	PC	0	0	2	1	40	60	100
3	2440272	Basic Electrical and Electronic Engineering Laboratory	HS	0	0	2	1	40	60	100
		<b>Skill Development Course</b>								
1	2430396	Automotive Design Course - II	SDC	0	0	2	1	40	60	100
		<b>Mandatory Course</b>								
1	2440021	Environmental Science	*MC	0	0	0	0	-	-	-
<b>Total Credits</b>				<b>14</b>	<b>1</b>	<b>10</b>	<b>20</b>	<b>400</b>	<b>600</b>	<b>1000</b>

\*MC - Satisfied/Unsatisfied

**V SEMESTER**

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIA)	External (SEE)	Total
		<b>Theory</b>								
1	2450329	Design of Machine Elements	PC	3	1	0	4	40	60	100
2	2450330	Metrology and Machine Tools	PC	3	0	0	3	40	60	100
3	2450331	Thermal Engineering - II	PC	3	0	0	3	40	60	100
4		Open Elective - I	OE	3	0	0	3	40	60	100
5		Professional Elective - I	PE	3	0	0	3	40	60	100
		<b>Laboratory</b>								
1	2450378	Metrology and Machine Tools Laboratory	PC	0	0	2	1	40	60	100
2	2450379	Theory of Machines Laboratory	PC	0	0	2	1	40	60	100
3	2450380	Thermal Engineering Laboratory	PC	0	0	2	1	40	60	100
		<b>Project</b>								
1	2450387	Field Based Project	*PS	0	0	2	1	100	-	100
		<b>Mandatory Course</b>								
1	2450022	Gender Sensitization	**MC	0	0	0	0	-	-	-
<b>Total Credits</b>				<b>15</b>	<b>1</b>	<b>8</b>	<b>20</b>	<b>420</b>	<b>480</b>	<b>900</b>

**\*PS – Students have to complete Field Based Project during the semester break for a minimum of 2 weeks after the fourth semester.**

**\*\*MC - Satisfied/Unsatisfied**

## VI SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIA)	External (SEE)	Total
		<b>Theory</b>								
1	2460332	Design of Transmission Systems	PC	3	1	0	4	40	60	100
2	2460333	Heat Transfer	PC	3	1	0	4	40	60	100
3	2460334	Finite Element Analysis	PC	3	0	0	3	40	60	100
4		Open Elective - II	OE	3	0	0	3	40	60	100
5		Professional Elective - II	PE	3	0	0	3	40	60	100
		<b>Laboratory</b>								
1	2460381	Heat Transfer Laboratory	PC	0	0	2	1	40	60	100
2	2460382	Computer Aided Engineering Laboratory	PC	0	0	2	1	40	60	100
3	2460383	Computer Aided Production Drawing Practice Laboratory	PC	0	0	2	1	40	60	100
		<b>Mandatory Course</b>								
1	2460025	Human Values and Professional Ethics	*MC	0	0	0	0	-	-	-
<b>Total Credits</b>				<b>15</b>	<b>2</b>	<b>6</b>	<b>20</b>	<b>320</b>	<b>480</b>	<b>800</b>

\*MC - Satisfied/Unsatisfied

## VII SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIA)	External (SEE)	Total
		<b>Theory</b>								
1	2470335	Instrumentation and Control Systems	PC	2	0	0	2	40	60	100
2	2470336	CAD/CAM	PC	3	0	0	3	40	60	100
3		Open Elective - III	OE	3	0	0	3	40	60	100
4		Professional Elective - III	PE	3	0	0	3	40	60	100
5		Professional Elective - IV	PE	3	0	0	3	40	60	100
		<b>Laboratory</b>								
6	2470384	CAD/CAM Laboratory	PC	0	0	2	1	40	60	100
7	2470385	Instrumentation and Control Systems Laboratory	PC	0	0	2	1	40	60	100
	2470392	Internship - II	*PS	0	0	2	1	100	-	100
		<b>Project</b>								
8	2470388	Project Stage - I	PS	0	0	6	3	100	-	100
		<b>Mandatory Course</b>								
9	2470023	Constitution of India	**MC	0	0	0	0	-	-	-
<b>Total Credits</b>				<b>14</b>	<b>0</b>	<b>12</b>	<b>20</b>	<b>380</b>	<b>420</b>	<b>900</b>

**\*PS - Students have to complete Internship - II during the semester break for a minimum of 2 weeks after the six semester.**

**\*\*MC - Satisfied/Unsatisfied**

## VIII SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIA)	External (SEE)	Total
		<b>Theory</b>								
1	2480010	Business Economics and Financial Analysis	HSMC	3	0	0	3	40	60	100
2		Professional Elective - V	PE	3	0	0	3	40	60	100
3		Professional Elective - VI	PE	3	0	0	3	40	60	100
		<b>Project</b>								
4	2480389	Technical seminar	PS	0	0	4	2	100	-	100
5	2480390	Project Stage - II	PS	0	0	18	9	40	60	100
<b>Total Credits</b>				<b>9</b>	<b>0</b>	<b>22</b>	<b>20</b>	<b>260</b>	<b>240</b>	<b>500</b>



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### **PROFESSIONAL ELECTIVE COURSES**

#### **PE I - Professional Elective I**

<b>S. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	2450341	Mechatronics
2	2450342	Non-Destructive Testing
3	2450343	Automation in Manufacturing
4	2450344	Microprocessor in Automation

#### **PE II - Professional Elective II**

<b>S. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	2460345	Non-Traditional Machining Process
2	2460346	Metal forming Technology
3	2460347	Operation Research
4	2460348	Flexible Manufacturing Systems

#### **PE III - Professional Elective III**

<b>S. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	2470349	Refrigeration and Air Conditioner
2	2470350	Automobile Engineering
3	2470351	Computational Fluid Dynamics
4	2470352	Hydraulic and Pneumatics

#### **PE IV - Professional Elective IV**

<b>S. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	2470353	Composite Materials & Mechanics
2	2470354	Robotics
3	2470355	Production Planning Control
4	2470356	Mechanical Vibrations

#### **PE V - Professional Elective V**

<b>S. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	2480357	Total quality management
2	2480358	Quality and reliability
3	2480359	Artificial intelligent in Mechanical Engineering
4	2480360	Surface Engineering & Tribology

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**PE VI - Professional Elective VI**

<b>S. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	2480361	Fuzzy logic & Artificial neural networks
2	2480362	Introduction to Industrial 4.0
3	2480363	Solar energy technology
4	2480364	Industrial Management

**OPEN ELECTIVE COURSES****Open Electives**

<b>S. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	2450301	Elements of Mechanical Engineering
	2450302	Introduction to Engineering Materials
2	2460303	Introduction to Robotics
	2460304	Introduction to Automobile Engineering
3	2470305	Additive Manufacturing and its Applications
	2470306	Non Conventional Energy Sources