

# Birla Institute of Technology, Mesra, Ranchi

## Course Structure for B.Tech. (Mechanical Engineering)

Based on NEP-2020, CBCS and OBE, Effective from 2024-2025

Sr. No.	Semester of Study (Recommended)	Category of Course	Course Code	Subjects	Mode of Delivery & Credits <i>L-Lecture; T-Tutorial; P-Practical</i>			Total Credits
					L (Periods / Week)	T (Periods/ Week)	P (Periods/ Week)	
<b>FIRST</b>					<b>THEORY</b>			
I.1		FS	MA24101	Mathematics - I	3	1	0	4
I.2			PH24101	Physics	3	1	0	4
I.3			BE24101	Biological Science for Engineers	2	0	0	2
I.4		GE	CS24101	Programming for Problem Solving	3	1	0	4
I.5			EE24101	Basics of Electrical Engineering	2	1	0	3
<b>LABORATORIES</b>								
I.6		FS	PH24102	Physics Laboratory	0	0	2	1
I.7		GE	CS24102	Programming for Problem Solving Laboratory	0	0	2	1
I.8			EE24102	Electrical Engineering Laboratory	0	0	2	1
I.9		HSS	HS24131	Communication Skill - I	0	0	3	1.5
I.10		MC	MC24 101/102/1 03 /104/105	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) /Entrepreneurship	0	0	2	1
<b>TOTAL (Theory + Labs)</b>								<b>22.5</b>
<b>SECOND</b>					<b>THEORY</b>			
II.1		FS	MA24103	Mathematics - II	3	1	0	4
II.2			CH24101	Chemistry	3	1	0	4
II.3		GE	EC24101	Basic Electronics	2	1	0	3
II.4			ME24101	Basics of Mechanical Engineering	2	1	0	3
II.5		FS	CE24101	Environmental Science	2	0	0	2
<b>LABORATORIES</b>								
II.6		FS	CH24102	Chemistry Laboratory	0	0	2	1
II.7		GE	EC24102	Basic Electronics Laboratory	0	0	2	1
II.8			ME24102	Engineering Graphics	0	0	4	2
II.9			PE24102	Workshop Practice	0	0	2	1
II.10		MC	MC24 106/107/1 08/109 /110	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) /Entrepreneurship	0	0	2	1
<b>TOTAL (Theory + Labs)</b>								<b>22</b>
<b>GRAND TOTAL FOR FIRST YEAR</b>								<b>44.5</b>
<b>THIRD</b>					<b>THEORY</b>			
III.1		PC	ME24201	Thermodynamics	3	0	0	3
III.2		PC	ME24203	Fluid Mechanics and Hydraulic Machines	3	0	0	3

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III.3			ME24205	Strength of Materials	3	1	0	4
III.4			PE24201	Introduction to Materials Engineering	3	0	0	3
III.5			PE22297	Manufacturing Processes	3	0	0	3
III.6		FS	MA24201	Numerical Methods	2	0	0	2
III.7		HSS	MT24131	UHV-II: Understanding Harmony	3	0	0	3
<b>LABORATORIES</b>								
III.8		FS	MA24202	Numerical Methods Lab	0	0	2	1
III.9		PC	ME24202	Fluid Mechanics and Hydraulic Machines Lab	0	0	2	1
III.10		MC	MC24 201/202/203/204 /205	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) / Entrepreneurship	0	0	2	1
<b>TOTAL (Theory + Labs)</b>								<b>24</b>
<b>FOURTH</b>		<b>THEORY</b>						
IV.1		PC	ME24207	Kinematics and Dynamics of Machines	3	1	0	4
IV.2		PC	ME24209	Thermal Energy Conversion Systems	3	1	0	4
IV.3		PC	ME24211	Machine Design	3	1	0	4
IV.4		PE	ME24213, 215, 217, 219	Programme Elective - I	3	1	0	4
IV.5		OE	XXXXXX/ MO24201	Open Elective - I / MOOC - I	3	0	0	3
IV.6		HSS	HS24211	Indian Knowledge System	2	0	0	0
<b>LABORATORIES</b>								
IV.7		PC	ME24208	Basic Mechanical Engineering lab	0	0	2	1
IV.8		PC	ME24210	Dynamics of Machines Lab	0	0	3	1.5
IV.9		PC	PE24298	Manufacturing processes Lab	0	0	3	1.5
IV.10		MC	MC24 206/ 207/208 / 209/210	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) / Entrepreneurship	0	0	2	1
<b>TOTAL (Theory + Labs)</b>								<b>24</b>
<b>GRAND TOTAL FOR SECOND YEAR</b>								<b>48</b>
<b>FIFTH</b>		<b>THEORY</b>						
V.1		PC	ME24301	I C Engines and Gas Turbines	3	1	0	4
V.2		PC	ME24303	Mechanical Vibration	3	0	0	3
V.3		PC	ME24305	Heat and Mass Transfer	3	0	0	3
V.4		PE	ME24 313, 315, 317, 319, PE24313	Programme Elective -II	3	0	0	3
V.5		PE	ME24 321,323, 325, PE24315	Programme Elective -III	3	0	0	3
V.6		OE	XXXXXX/ MO24301	Open Elective - II / MOOC - II	3	0	0	3
<b>LABORATORIES</b>								
V.7		PC	ME24302	Heat Transfer Lab	0	0	2	1
V.8			ME24304	Internal Combustion Engines Lab	0	0	2	1
V.9		HSS	HS24133	Communication Skill - II	0	0	3	1.5

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V.10		PC	ME24300	Project - I				2
<b>TOTAL (Theory + Labs)</b>								<b>24.5</b>
	<b>SIXTH</b>	<b>THEORY</b>						
VI.1		PC	ME24307	Computer Aided Design	2	0	0	2
VI.2		PC	ME24309	Automobile Engineering	3	1	0	4
VI.3		PC	ME24311	Robotics Engineering	3	1	0	4
VI.4		PE	ME24, 329, 331, 333, PE24335	Programme Elective -IV	3	0	0	
VI.5		PE	ME24 335, 337, 339, PE24345	Programme Elective -V	3	0	0	3
VI.6		OE	XX24XXX / MO24303	Open Elective - III / MOOC - III	3	0	0	3
<b>LABORATORIES</b>								
VI.7		PC	ME24306	Robotics and Automation Lab	0	0	3	1.5
VI.8			ME24308	Automobile Engineering Lab	0	0	3	1.5
VI.9			ME24310	Computer Aided Design and Drafting lab	0	0	2	1
VI.10			ME24350	Project - II				2
<b>TOTAL (Theory + Labs)</b>								<b>25</b>
<b>GRAND TOTAL FOR THIRD YEAR</b>								<b>49.5</b>
	<b>SEVENTH</b>	<b>THEORY</b>						
VII.1		PC	ME24401	Refrigeration and Air Conditioning	3	1	0	4
VII.2		PE	ME24 403, 405, 407, 409, PE24 407, 413	Prog Elective -VI	3	0	0	3
VII.3		PE	ME24 411, 413/MO24 401	Open Elective - IV / MOOC - IV	3	0	0	3
VII.4		HSS	MT24204	Constitution of India	2	0	0	0
<b>LABORATORIES</b>								
VII.5		PC	ME24404	Refrigeration and Air Conditioning Lab	0	0	2	1
VII.6		MC	MC24400	Summer Training (Minimum Four Weeks / 160 Hrs)				4
VII.7		PC	ME24400	Project - III				3
<b>TOTAL (Theory + Labs)</b>								<b>18</b>
VIII.1	<b>EIGHTH</b>	PC	ME24450/ ME24490	Project-IV / Industry Internship				6
VIII.2			ME24498	Comprehensive Viva				2
<b>TOTAL (Theory + Labs)</b>								<b>8</b>
<b>GRAND TOTAL FOR FOURTH YEAR</b>								<b>26</b>
<b>GRAND TOTAL FOR B.TECH.</b>								<b>168</b>

  
 Head  
 Mechanical Engineering

  
 Dean (UGS)