Symbiosis Institute of Technology, Pune
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<table>
<tr><td>1.</td><td>OBJECTIVE</td><td colspan="4">B.Tech Mechanical Engineering is a full-time four year graduation programme, which aims at transforming a student into a technically sound professional. The syllabus contains courses on basic sciences, technical arts, humanities & liberal arts and professional courses. The mix of these courses has been evolved with an aim to produce professionals who have knowledge not only of Engineering but who are good managers to contribute in a cross-functional team and have human values.
Being a professional programme it ensures a healthy balance between theoretical foundation and practical exposure to the present day world.
The emphasis is to develop all round personality that would enable the students to take up the challenges of the corporate world and also become responsible citizens of the society.</td></tr>
<tr><td>2.</td><td>DURATION (IN MONTHS)</td><td colspan="4">48 (Full Time)</td></tr>
<tr><td>3.</td><td>INTAKE</td><td colspan="4">60</td></tr>
<tr><td rowspan="4">4.</td><td rowspan="4">RESERVATION</td><td rowspan="2">I.Within the sanctioned intake</td><td>a) SC
(In Percentage)</td><td>b) ST
(In Percentage)</td><td>c) Differently abled
(In Percentage)</td></tr>
<tr><td>15</td><td>7.5</td><td>3</td></tr>
<tr><td rowspan="2">II.Over and above the sanctioned intake</td><td colspan="2">a) Kashmiri Migrants
(In Seats)</td><td>b) International Students
(In Percentage)</td></tr>
<tr><td colspan="2">2</td><td>20</td></tr>
<tr><td>5.</td><td>ELIGIBILITY</td><td colspan="4">Passed 10+2 examination with Physics, Chemistry and Mathematics as compulsory subjects. Obtained at least 45% marks (40% marks in case of candidates belonging to reserved category) in the above subjects taken together.
OR Passed D.Voc. Stream in the same or allied sector. (The University will offer suitable bridge courses such as Mathematics, Physics, Engineering drawing, etc., for the students coming from diverse backgrounds to prepare Level playing field and desired learning outcomes of the programme).
B.Tech. : Lateral Entry</td></tr>
</table>

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		Passed Minimum Three-years/ Two-year (Lateral Entry) Diploma examination with at least 45% marks (40% marks in case of candidates belonging to reserved category) in ANY branch of Engineering and Technology. OR Passed B.Sc. Degree from a recognized University as defined by UGC, with at least 45% marks (40% marks or equivalent grade for Scheduled Caste / Scheduled Tribes) and passed 10+2 examination with Mathematics as a subject. OR Passed B. Voc/3-year D.Voc. Stream in the same allied sector. (The Constituent will offer suitable bridge courses such as Mathematics, Physics, Engineering drawing, etc., for the students coming from diverse backgrounds to achieve desired learning outcomes of the programme).			
6.	**SELECTION PROCEDURE**	Merit list by valid score of Symbiosis Entrance Test (SET) or Joint Entrance Examination (JEE - Main) or Any State Government Engineering Entrance Examination			
7.	**MEDIUM OF INSTRUCTION**	English			
8.	**PROGRAMME PATTERN**	Semester			
9.	**COURSE & SPECIALISATION**	Annexure A: Bachelor of Technology (Mechanical Engineering) Students may pursue optional 'Honours' specialisation in one of the specialisation areas by completing additional 20 credits in Semester - 5, 6, 7 as specified in Annexure B or optional 'Minor' Specialisation by completing additional 18 credits in Semester - 5, 6, 7 as specified in Annexure C. Annexure B: Honours specialisation area. 1. Automobile Engineering with Hybrid and Autonomous Technology 2. CAD/CAM 3. Smart Manufacturing (Industry 4.0) Annexure C: Optional 'Minor' specialisation area 1. Artificial Intelligence and Machine Learning 2. Data Science			
10.	**FEE**		**Academic Fee p.a**	**Institute Deposit**	**Total**

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	Indian Students (Amount in INR)		300000	20000	320000
	International Students	**NRI/ PIO/ OCI Category (Amount in US$)**	5875	275	6150
		Foreign National Category (Amount in US$)	1300	275	1575

11.	**ASSESSMENT**	The theory courses will have 40% Continuous Assessment and 60% Term End [University] examination, Lab courses (Practical) will have 60% Continuous Assessment and 40% Term End [University] examination however, some courses (not more than 30% of the total programme credits) may have 100% Continuous Assessment.
12.	**STANDARD OF PASSING**	The assessment of the student for each examination is done, based on relative performance. Maximum Grade Point (GP) is 10 corresponding to O (Outstanding). For all courses, a student is required to pass both internal and external examination separately with a minimum Grade Point of 4 corresponding to Grade P. Students securing less than 40% absolute marks in each head of passing will be declared FAIL. The University awards a degree to the student who has achieved a minimum CGPA of 4 out of maximum of 10 CGPA for the programme.

13.	**AWARD OF DEGREE**	Bachelor of Technology (Mechanical Engineering) OR Bachelor of Technology (Mechanical Engineering) with Honours in Automobile Engineering with Hybrid and Autonomous Technology/ CAD/CAM/ Smart Manufacturing (Industry 4.0) OR/ and Bachelor of Technology (Mechanical Engineering) with Minor in Artificial Intelligence and Machine Learning/ Data Science as applicable will be awarded at the end of semester 8 examination by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA.
14.	**CLASSIFICATION OF CREDITS**	
	Track 1	

1	8	8	3	0	1	0	0	0	20	10*	As per the student's choice
2	8	8	0	0	2		0	2			
3	3	2	12	3	0	0	0	0	20	1 *	
4	0	0	11	4	3	3	0	0	21	1 *	
5	0	0	17	0	0	3	2	0	22	2 *	
6	0	0	17	0	0	3	2	0	22	1 *	
7	0	2	9	6	0	0	4	0	21	1 *	
8	0	0	0	0	0	0	14	0	14	0	
Total	**19**	**20**	**69**	**13**	**6**	**9**	**22**	**2**	**160**	**0**	
Track 2											
1	8	8	3	0	1	0	0	0	20	0	As per the student's choice
2	8	8	0	0	2	0	0	2	20	1 *	
3	3	2	12	3	0	0	0	0	20	1 *	
4	0	0	11	4	3	3	0	0	21	1 *	
5	0	0	17	0	0	3	2	0	22	2 *	
6	0	0	17	0	0	3	2	0	22	1 *	
7	0	0	2	3	0	0	16	0	21	1 *	
8	0	0	0	0	0	0	14	0	14	0	
Total	**19**	**18**	**62**	**10**	**6**	**9**	**34**	**2**	**160**	**0**	
Optional Additional Courses (Honours)											
7B	0	0	0	0	0	0	7	0	7	0	
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Optional Additional Courses (Minor)											
7B	0	0	0	0	0	0	6	0	6	0	
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

* Satisfactory completion of non credit courses 'Health and Wellness', '*Vasudhaiva Kutumbakam*' and 'Career Essentials I to V' is mandatory for award of degree.
Additional Note: #Health and Wellness Module I and Module II will be conducted during the semesters mentioned in the programme structure. However, the course will be listed on the students' grade sheets as "Health and Wellness" in the semester in which the institute's course code is officially assigned.

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Annexure A

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 1													
Generic Core Courses													
TEE7246	0701250101	Matrices and Calculus	BS		3	1	0	0	0	40	60	4	100
TEE7232	0701250102	Applied Chemistry	BS		3	0	2	15	10	30	45	4	100
P5827	0701250103	Manufacturing Processes	PC		3	0	2	15	10	30	45	4	100
P5826	0701250104	Introduction to CAD for Mechanical Engineers	ES		2	0	4	30	20	20	30	4	100
TE7289	0701250105	Programming in C Lab	ES		0	0	2	15	10	0	0	1	25
T6873	0701250106	Creative Thinking	HSMC		1	0	0	0	0	25	0	1	25
TEE7364	0701250107	Tinker and IDEA Lab	ES		0	0	2	25	0	0	0	1	25
TM2278	0701250108	Introduction to Environment and Sustainability	ES		0	0	2	25	0	0	0	1	25
				Total	**12**	**1**	**14**	**125**	**50**	**145**	**180**	**20**	**500**
Semester : 2													
Generic Core Courses													
TEE7231	0701250201	Advanced Calculus	BS		3	1	0	0	0	40	60	4	100
THM6144	0701250202	Indian Knowledge Systems	IKS		2	0	0	0	0	50	0	2	50
TEE7243	0701250203	Fundamentals of Mechanics	BS		3	0	2	15	10	30	45	4	100
THM6150	0701250204	Technical and Professional Communication Skills	HSMC		0	0	2	25	0	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TEE7327	0701250205	Foundations of Mechanical Engineering	ES		2	0	2	25	0	50	0	3	75
P5828	0701250206	Smart Systems Fundamentals	ES		3	0	2	15	10	30	45	4	100
TE7555	0701250207	Introduction to Python Programming Lab	ES		0	0	2	15	10	0	0	1	25
T6732	0701250208	Critical Thinking	HSMC		1	0	0	0	0	25	0	1	25
TEE7265	0701250209	Career Essentials - I *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**14**	**1**	**10**	**95**	**30**	**225**	**150**	**20**	**500**
Semester : 3													
Generic Core Courses													
TEE7250	0701250301	Probability, Statistics & Partial Differential Equations	BS		2	1	0	0	0	30	45	3	75
TEE7335	0701250302	Strength of Materials and Testing	PC		2	1	2	15	10	30	45	4	100
P4427	0701250303	Fluid Mechanics and machines	PC		2	1	2	15	10	30	45	4	100
TE7367	0701250304	Engineering Materials and Metallurgy	PC		3	0	0	0	0	30	45	3	75
P4390	0701250305	Engineering Thermodynamics	PC		3	0	2	15	10	30	45	4	100

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
P5230	0701250306	Design Thinking	ES		1	0	0	0	0	25	0	1	25
P4411	0701250307	Principles of Economics	ES		1	0	0	0	0	25	0	1	25
P4781	0701250308	Career Essentials - II *	MC		0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
TH4788		Health and Wellness Module I #			0	0	0	0	0	0	0	0	0
				Total	**14**	**3**	**6**	**45**	**30**	**200**	**225**	**20**	**500**
Semester : 4													
Generic Core Courses													
TEE7321	0701250401	Computer Aided Design and Machine Drawing	PC		0	0	2	15	10	0	0	1	25
P5760	0701250402	Kinematics and Dynamics of Machines	PC		3	0	2	15	10	30	45	4	100
TEE7407	0701250403	Mechatronics	PC		1	0	0	0	0	25	0	1	25
P5930	0701250404	Mechatronics Lab	PC		0	0	2	15	10	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
P5779	0701250405	Hydraulic and Pneumatic Systems	PC		2	0	2	15	10	20	30	3	75
TEE7401	0701250406	Total Productive Maintenance	PC		0	0	2	15	10	0	0	1	25
P4618	0701250407	Service Learning	HSMC		0	0	4	30	20	0	0	2	50
P4884	0701250408	Foundations of Entrepreneurship	HSMC		1	0	0	0	0	25	0	1	25
P4782	0701250409	Career Essentials - III *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
TH4789		Health and Wellness Module II #			0	0	0	0	0	0	0	0	0
Total					**7**	**0**	**14**	**105**	**70**	**100**	**75**	**14**	**350**
Programme Elective Courses Group - I (Choose Any One Course)													
P5766	0701250410	Finite Element Methods	PE		3	0	2	15	10	30	45	4	100
P4876	0701250411	Computational Fluid Dynamics	PE		3	0	2	15	10	30	45	4	100
P5819	0701250412	IC Engine	PE		3	0	2	15	10	30	45	4	100
Total Required Credits								**15**	**10**	**30**	**45**	**4**	**100**
Multidisciplinary Open Elective (Choose any one course)													
P5208	0701250413	Quantum Computing for Engineers	MOPE	Applied Science	2	1	0	0	0	30	45	3	75
P5209	0701250414	Mathematics for Data Science	MOPE	Applied Science	2	1	0	0	0	30	45	3	75
P4627	0701250415	Smart Cities Planning and Management	MOPE	Civil Engineering	2	1	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
P4633	0701250416	Intelligent Waste Management Techniques	MOPE	Civil Engineering	2	1	0	0	0	30	45	3	75
P4811	0701250417	Web Technologies	MOPE	Computer Science and Engineering	2	1	0	0	0	30	45	3	75
P4812	0701250418	Data Science	MOPE	Computer Science and Engineering	2	1	0	0	0	30	45	3	75
TEE7018	0701250419	Engineering Simulation and Modeling Tools	MOPE	Electronics and Telecommunication Engineering	2	1	0	0	0	30	45	3	75
P4278	0701250420	Medical Electronics	MOPE	Electronics and Telecommunication Engineering	2	1	0	0	0	30	45	3	75
P4787	0701250421	Fundamentals of Machine Learning	MOPE	Artificial Intelligence and Machine Learning	2	1	0	0	0	30	45	3	75
P4788	0701250422	AI System Development	MOPE	Artificial Intelligence and Machine Learning	2	1	0	0	0	30	45	3	75
P5214	0701250423	Fundamentals of Robotics and Automation	MOPE	Robotics and Automation	2	1	0	0	0	30	45	3	75
P5215	0701250424	Robotic Process Automation	MOPE	Robotics and Automation	2	1	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 5													
Generic Core Courses													
P5761	0701250501	Manufacturing Technology	PC		2	0	2	15	10	20	30	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
P4423	0701250502	Design of Machine Elements	PC		3	1	0	0	0	40	60	4	100
P5733	0701250503	Programmable Logic Controller and Human Machine Interface	PC		2	0	4	30	20	20	30	4	100
TEE7397	0701250504	Servo Motors and Drives	PC		1	0	0	0	0	25	0	1	25
TEE7398	0701250505	Servo Motors and Drives Lab	PC		0	0	2	15	10	0	0	1	25
P5735	0701250506	Process Control and Instrumentation	PC		2	0	4	30	20	20	30	4	100
TE7290	0701250507	Project Based Learning -I	PIS		0	0	4	30	20	0	0	2	50
P4784	0701250508	Career Essentials - IV *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
SMC001	0701250509	*Vasudhaiva Kutumbakam* *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
Total					**10**	**1**	**16**	**120**	**80**	**125**	**150**	**19**	**475**
Multidisciplinary Open Elective (Choose any one course)													
P5210	0701250510	Financial Mathematics	MOPE	Applied Science	2	1	0	0	0	30	45	3	75
P5211	0701250511	Advanced Materials	MOPE	Applied Science	2	1	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
P4656	0701250512	Sustainability Engineering- Design and Innovation	MOPE	Civil Engineering	2	1	0	0	0	30	45	3	75
P4658	0701250513	Occupational Health and Safety Management	MOPE	Civil Engineering	2	1	0	0	0	30	45	3	75
P4840	0701250514	Introduction to Cloud Computing	MOPE	Computer Science and Engineering	2	1	0	0	0	30	45	3	75
P4844	0701250515	Agile Methodologies	MOPE	Computer Science and Engineering	2	1	0	0	0	30	45	3	75
P4472	0701250516	Embedded System and IoT	MOPE	Electronics and Telecommunication Engineering	2	1	0	0	0	30	45	3	75
P5241	0701250517	Basics of 5G Technology	MOPE	Electronics and Telecommunication Engineering	2	1	0	0	0	30	45	3	75
P4790	0701250518	Deep Learning Essentials	MOPE	Artificial Intelligence and Machine Learning	2	1	0	0	0	30	45	3	75
P4789	0701250519	Optimization for ML Systems	MOPE	Artificial Intelligence and Machine Learning	2	1	0	0	0	30	45	3	75
P5216	0701250520	Industrial Robotics	MOPE	Robotics and Automation	2	1	0	0	0	30	45	3	75
P5217	0701250521	PLC and SCADA	MOPE	Robotics and Automation	2	1	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 6													

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Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Generic Core Courses													
P5741	0701250601	Industrial Internet of Things	PC		2	0	4	30	20	20	30	4	100
P5742	0701250602	AI for Manufacturing	PC		2	0	4	30	20	20	30	4	100
TEE7385	0701250603	Applied ARVR	PC		0	0	2	15	10	0	0	1	25
P5740	0701250604	Manufacturing Systems	PC		2	0	4	30	20	20	30	4	100
P4412	0701250605	Heat Transfer	PC		3	0	2	15	10	30	45	4	100
TE7291	0701250606	Project Based Learning-II	PIS		0	0	4	30	20	0	0	2	50
P4785	0701250607	Career Essentials - V *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**9**	**0**	**20**	**150**	**100**	**90**	**135**	**19**	**475**
Multidisciplinary Open Elective (Choose any one course)													
P5212	0701250608	Bioinformatics	MOPE	Applied Science	2	1	0	0	0	30	45	3	75
P5213	0701250609	Introduction to Space Science	MOPE	Applied Science	2	1	0	0	0	30	45	3	75
P4657	0701250610	GIS and Remote Sensing Analytics	MOPE	Civil Engineering	2	1	0	0	0	30	45	3	75
P4659	0701250611	Environmental Impact Assessment	MOPE	Civil Engineering	2	1	0	0	0	30	45	3	75
P4830	0701250612	Software Testing and Quality Assurance	MOPE	Computer Science and Engineering	2	1	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
P4831	0701250613	Introduction to AR-VR	MOPE	Computer Science and Engineering	2	1	0	0	0	30	45	3	75
P4475	0701250614	Renewable Energy Systems	MOPE	Electronics and Telecommunication Engineering	2	1	0	0	0	30	45	3	75
P4274	0701250615	Semiconductor Technology Trends	MOPE	Electronics and Telecommunication Engineering	2	1	0	0	0	30	45	3	75
P4792	0701250616	Data Engineering and Applications	MOPE	Artificial Intelligence and Machine Learning	2	1	0	0	0	30	45	3	75
P4791	0701250617	Gen AI Tools and Techniques	MOPE	Artificial Intelligence and Machine Learning	2	1	0	0	0	30	45	3	75
P5218	0701250618	Mobile Robotics	MOPE	Robotics and Automation	2	1	0	0	0	30	45	3	75
P5219	0701250619	Introduction to Aerial Robotics and Drone Technology	MOPE	Robotics and Automation	2	1	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 7													
Track 1													
TEE7098	0701250701	Cyber Security	ES		2	0	0	0	0	20	30	2	50
P4432	0701250702	Refrigeration and Airconditioning	PC		3	0	2	15	10	30	45	4	100
P5769	0701250703	Smart Manufacturing and Digital Twins	PC		2	0	0	0	0	20	30	2	50

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
P4878	0701250704	Business Analytics Fundamentals	PC		2	0	2	15	10	20	30	3	75
T7804	0701250705	Project	PIS		0	0	8	60	40	0	0	4	100
SMC003	0701250706	Health and Wellness *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
Total Required Credits								**90**	**60**	**90**	**135**	**15**	**375**
Programme Elective Courses Group- I (Choose any one course)													
T7644	0701250707	Operations Research	PE		3	0	0	0	0	30	45	3	75
TE7385	0701250708	Power Plant Engineering	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Programme Elective Courses Group- II (Choose any one course)													
P4435	0701250709	Quality Assurance and Reliability Engineering	PE		3	0	0	0	0	30	45	3	75
TE7657	0701250710	Cyber Physical Security and cloud computing	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Track 2													
T7804	0701250705	Project	PIS		0	0	8	60	40	0	0	4	100

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Annexure A

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
SMC003	0701250706	Health and Wellness *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
F0002	0701250711	Flexi-Credit Course	PC		2	0	0	0	0	50	0	2	50
Total Required Credits								**60**	**40**	**50**	**0**	**6**	**150**
Programme Elective Courses Group- I (Choose any one course)													
T7644	0701250707	Operations Research	PE		3	0	0	0	0	30	45	3	75
TE7385	0701250708	Power Plant Engineering	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective courses Group (Choose any one Course)													
T7912	0701250712	Startup Internship	PIS		0	0	24	180	120	0	0	12	300
T7912	0701250713	Research Internship	PIS		0	0	24	180	120	0	0	12	300
T7912	0701250714	Industry Internship	PIS		0	0	24	180	120	0	0	12	300
Total Required Credits								**180**	**120**	**0**	**0**	**12**	**300**
Semester : 8													
Generic Core Courses													
T7912	0701250801	Internship	PIS		0	0	24	180	120	0	0	12	300

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Annexure A

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7802	0701250802	Seminar	PIS		0	0	4	30	20	0	0	2	50
				Total	**0**	**0**	**28**	**210**	**140**	**0**	**0**	**14**	**350**

Abbreviations (Nature)	Description
BS	Basic Sciences
ES	Engineering Sciences
PC	Professional Core
PE	Professional Elective
HSMC	Humanities and Social Sciences including Management
MOPE	Multidisciplinary Open Electives
PIS	Project, Internship, Seminar
IKS	Indian Knowledge System
L	Lecture
MC	Mandatory Course
T	Tutorial
CA	Continuous Assessment
ESE	End Semester Examination
LAB	Laboratory

Track 1 (T1): For Regular Students
Track 2 (T2): For Students opting for Internship/ Entrepreneurship

Definition:
Honours: Students have the option to pursue an "Honours" degree by completing an additional 20 credits within their major discipline, focusing on more advanced, specialised, emerging, or multidisciplinary courses beyond the standard requirements of the B.Tech degree.

Minors: Students have the option to pursue a "Minor" by completing 18 credits in a discipline/ specialisation other than their major discipline beyond the standard requirements of the B.Tech. Degree.

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Semester	Continuous Assessment	End Semester Examination	Total Credits	Total Marks
Semester 1	7	13	20	500
Semester 2	7	13	20	500
Semester 3	2	18	20	500
Semester 4	2	19	21	525
Semester 5	1	21	22	550
Semester 6	0	22	22	550
Semester 7	2	40	42	1050
Semester 8	0	14	14	350
Total	**21**	**160**	**181**	**4525**

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Annexure B
Optional 'Honours' Specialisation

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 5													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
P4666	0701250522	Automotive Electronics and Instrumentation	PC		3	0	0	0	0	30	45	3	75
TE7650	0701250523	Automotive Engine and Transmission System	PC		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**
Semester : 5													
CAD/CAM Specialisation Core Courses													
P4452	0701250524	Advanced CAD	PC		2	0	2	15	10	20	30	3	75
P4453	0701250525	CAD CAM For 3 D Printing	PC		2	0	2	15	10	20	30	3	75
				Total	**4**	**0**	**4**	**30**	**20**	**40**	**60**	**6**	**150**
Semester : 5													
Smart Manufacturing (Industry 4.0) Specialisation Core Courses													
TE7668	0701250526	Modern Sensors and Actuators	PC		2	0	2	15	10	20	30	3	75
P4763	0701250527	AIML for Smart Manufacturing	PC		2	0	2	15	10	20	30	3	75
				Total	**4**	**0**	**4**	**30**	**20**	**40**	**60**	**6**	**150**

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Annexure B
Optional 'Honours' Specialisation

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 6													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
TEE7318	0701250620	Automotive AI	PC		3	0	2	15	10	30	45	4	100
P5770	0701250621	Hybrid Vehicles	PC		0	0	6	75	0	0	0	3	75
				Total	**3**	**0**	**8**	**90**	**10**	**30**	**45**	**7**	**175**
Semester : 6													
CAD/CAM Specialisation Core Courses													
P4454	0701250622	Structural and Dynamic Analysis	PC		3	0	2	15	10	30	45	4	100
P5771	0701250623	Multi Axis CNC Toolpaths	PC		0	0	6	75	0	0	0	3	75
				Total	**3**	**0**	**8**	**90**	**10**	**30**	**45**	**7**	**175**
Semester : 6													
Smart Manufacturing (Industry 4.0) Specialisation Core Courses													
P5265	0701250624	Digital Manufacturing Systems	PC		3	0	2	15	10	30	45	4	100
P5772	0701250625	Digital Twins	PC		0	0	6	75	0	0	0	3	75
				Total	**3**	**0**	**8**	**90**	**10**	**30**	**45**	**7**	**175**

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Annexure B
Optional 'Honours' Specialisation

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 7													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
T7805	0701250715	Specialization Project	PIS		0	0	10	75	50	0	0	5	125
T7802	0701250716	Specialization Seminar	PIS		0	0	4	30	20	0	0	2	50
				Total	**0**	**0**	**14**	**105**	**70**	**0**	**0**	**7**	**175**
Semester : 7													
CAD/CAM Specialisation Core Courses													
T7805	0701250715	Specialization Project	PIS		0	0	10	75	50	0	0	5	125
T7802	0701250716	Specialization Seminar	PIS		0	0	4	30	20	0	0	2	50
				Total	**0**	**0**	**14**	**105**	**70**	**0**	**0**	**7**	**175**
Semester : 7													
Smart Manufacturing (Industry 4.0) Specialisation Core Courses													
T7805	0701250715	Specialization Project	PIS		0	0	10	75	50	0	0	5	125
T7802	0701250716	Specialization Seminar	PIS		0	0	4	30	20	0	0	2	50
				Total	**0**	**0**	**14**	**105**	**70**	**0**	**0**	**7**	**175**

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Optional 'Honours' Specialisation

Semester	Continuous Assessment	End Semester Examination	Total Credits	Total Marks
Automobile Engineering with Hybrid and Autonomous Technology				
Semester 5	0	6	6	150
Semester 6	3	4	7	175
Semester 7	0	7	7	175
Total	**3**	**17**	**20**	**500**
CAD/CAM				
Semester 5	0	6	6	150
Semester 6	3	4	7	175
Semester 7	0	7	7	175
Total	**3**	**17**	**20**	**500**
Smart Manufacturing (Industry 4.0)				
Semester 5	0	6	6	150
Semester 6	3	4	7	175
Semester 7	0	7	7	175
Total	**3**	**17**	**20**	**500**

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Annexure C
Optional 'Minor' Specialisation

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 5													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
TE7273	0701250528	Machine Learning: Classification	PC		3	0	0	0	0	30	45	3	75
TE7274	0701250529	Machine Learning: Regression	PC		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**
Semester : 5													
Data Science Specialisation Core Courses													
TE7281	0701250530	Open Source Tools for Data Science	PC		4	0	0	0	0	40	60	4	100
TEE7029	0701250531	Database Concepts for Data Science	PC		2	0	0	0	0	20	30	2	50
				Total	**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**
Semester : 6													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
TE7903	0701250626	Introduction to Deep Learning	PC		3	0	0	0	0	30	45	3	75
TE7271	0701250627	Machine Learning Clustering and Retrieval	PC		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**

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Annexure C
Optional 'Minor' Specialisation

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 6													
Data Science Specialisation Core Courses													
TEE7101	0701250628	Natural Language Processing	PC		3	0	0	0	0	30	45	3	75
F0003	0701250629	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
				Total	**6**	**0**	**0**	**0**	**0**	**105**	**45**	**6**	**150**
Semester : 7													
Artificial Intelligence and Machine Learning Specialization Core Courses													
P5773	0701250717	AI in Design and Optimization	PC		0	0	4	30	20	0	0	2	50
P5774	0701250718	Heat Transfer and Thermal Management Optimization	PC		0	0	4	30	20	0	0	2	50
P5775	0701250719	Energy System and Renewable Optimization Using AI	PC		0	0	4	30	20	0	0	2	50
				Total	**0**	**0**	**12**	**90**	**60**	**0**	**0**	**6**	**150**
Semester : 7													
Data Science Specialization Core Courses													
P5776	0701250720	Data Driven Quality Control	PC		0	0	4	30	20	0	0	2	50

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Annexure C
Optional 'Minor' Specialisation

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
P5777	0701250721	Smart Manufacturing Analytics	PC		0	0	4	30	20	0	0	2	50
P5778	0701250722	Supply Chain and Inventory Analytics	PC		0	0	4	30	20	0	0	2	50
				Total	**0**	**0**	**12**	**90**	**60**	**0**	**0**	**6**	**150**

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Annexure C
Optional 'Minor' Specialisation

Semester	Continuous Assessment	End Semester Examination	Total Credits	Total Marks
Artificial Intelligence and Machine Learning				
Semester 5	0	6	6	150
Semester 6	0	6	6	150
Semester 7	0	6	6	150
Total	**0**	**18**	**18**	**450**
Data Science				
Semester 5	0	6	6	150
Semester 6	3	3	6	150
Semester 7	0	6	6	150
Total	**3**	**15**	**18**	**450**