Symbiosis Institute of Technology, Pune
Bachelor of Technology (Robotics and Automation)
Programme Structure 2024-28

<table>
<tr><td>1.</td><td>OBJECTIVE</td><td colspan="4">To generate competent manpower in the emerging areas of Robotics and Automation To inculcate among the students an aptitude for engineering and research in Industry 4.0 for generation of better and smarter solutions to real world problems.</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">120</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 colspan="2">b) International Students
(In Percentage)</td></tr>
<tr><td colspan="2">2</td><td colspan="2">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
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</td></tr>
</table>

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		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**	Selection would be based on joint merit of entrance exam score and PCM/PMV aggregate percentage			
7.	**MEDIUM OF INSTRUCTION**	English			
8.	**PROGRAMME PATTERN**	Semester			
9.	**COURSE & SPECIALISATION**	Annexure A: Bachelor of Technology (Robotics and Automation) Students may pursue optional 'Honours' OR 'Minor' specialization in one of the specialization areas by completing additional 20 credits in Semester: 5, 6 and 7 as specified in Annexure B for Honours and Annexure C for Minor in the respective specialization area. Annexure B: Optional 'Honours' specialization area 1. Aerial Robotics and Drone Technology Annexure C : Optional 'Minor' specialization area 1. Artificial Intelligence and Machine Learning 2. Data Science 3. Smart Cities and Urban Analytics 4. Computing 5. Automobile Engineering with Hybrid and Autonomous Technology 6. Computer Vision 7. Embedded Systems			
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

Note: For additional optional Specialisation 'Honours' or 'Minor', an additional fees of Rs. 25000/- will be charged in the third year.

11.	**ASSESSMENT**	The courses will have 40% Continuous Assessment and 60% 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 (Robotics and Automation) OR Bachelor of Technology (Robotics and Automation) with Honours in Aerial Robotics and Drone Technology OR Bachelor of Technology (Robotics and Automation) with Minor in Artificial Intelligence and Machine Learning /Data Science / Smart Cities and Urban Analytics/Computing/Automobile Engineering with Hybrid and Autonomous Technology/Computer Vision/Embedded Systems 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

Semester	Generic Core	Generic Elective	Specialisation Core	Specialisation Elective	Open Elective	Mandatory Non-Credit Course/s	Non-Credit Audit Course/s	Total
Common								
1	20	0	0	0	0	1 *	As per the student's choice	20
2	19	0	0	0	0	0		19
3	21	2	0	0	0	1 *		23
4	24	1	0	0	0	1 *		25
5	19	3	0	0	3	1 *		25
6	15	4	0	0	3	0		22
7	14	8	0	0	0	0		22
8	14	0	0	0	0	0		14
Total	**146**	**18**	**0**	**0**	**6**	**0**		**170**
Optional Additional Courses (Honours)								
Total	**0**	**0**	**20**	**0**	**0**	**0**		**20**

* Satisfactory completion of non credit courses 'Health and Wellness Module I', 'Health and Wellness Module II', '*Vasudhaiva Kutumbakam*' and 'Environmental Science' is mandatory for award of degree.

The revised programme structure supersedes the previously approved programme structure dated 06/10/2025 for the programme.

This Programme Structure is aligned with the norms laid down by the University and is approved by the Academic Council.
Hereafter changes (if any) which conform to the policy on "Curriculum Development and Review" would be permissible, subject to revision of the Programme Structure, following the specified processes.

Director - Academics

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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													
TE7168	0701270101	Engineering Mathematics -I	BS		3	1	0	0	0	40	60	4	100
T7391	0701270102	Physics	BS		3	0	0	0	0	30	45	3	75
TE7687	0701270103	Physics Lab	BS		0	0	2	10	15	0	0	1	25
T7383	0701270104	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	0701270105	Communication skills lab	HS		0	0	2	10	15	0	0	1	25
TEE7097	0701270106	Basic Manufacturing Practices	ES		0	0	4	50	0	0	0	2	50
TE7286	0701270107	Programming and Problem Solving	ES		2	0	0	0	0	20	30	2	50
TE7287	0701270108	Programming and Problem Solving Lab	ES		0	0	2	10	15	0	0	1	25
T6873	0701270109	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
TEE7096	0701270110	Engineering Mechanics and Material	ES		3	0	0	0	0	30	45	3	75
TE7188	0701270111	Environmental Science *			0	0	0	0	0	0	0	0	0
				Total	**14**	**1**	**10**	**80**	**45**	**165**	**210**	**20**	**500**
Semester : 2													
Generic Core Courses													
TE7169	0701270201	Engineering Mathematics -II	BS		3	1	0	0	0	40	60	4	100
TE7694	0701270202	Chemistry	BS		3	0	0	0	0	30	45	3	75
TE7695	0701270203	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7540	0701270204	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	0701270205	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
T7925	0701270206	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
TE7300	0701270207	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
TEE7197	0701270208	Software Tools for Robotics	ES		0	0	4	50	0	0	0	2	50
T6732	0701270209	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
				Total	**10**	**1**	**16**	**140**	**60**	**125**	**150**	**19**	**475**
Semester : 3													
Generic Core Courses													
TEE7407	0701270301	Mechatronics	PC		1	0	0	0	0	25	0	1	25
TEE7408	0701270302	Mechatronics Lab	PC		0	0	2	10	15	0	0	1	25
TE7688	0701270303	Statistics and Numerical Methods in Robotics	BS		3	0	0	0	0	30	45	3	75
TEE7405	0701270304	Robotic Control Systems	PC		2	0	0	0	0	20	30	2	50
TEE7406	0701270305	Robotic Control Systems Lab	PC		0	0	2	10	15	0	0	1	25
TEE7403	0701270306	Hydraulic and Pneumatic Systems	PC		2	0	0	0	0	50	0	2	50
TEE7404	0701270307	Hydraulic and Pneumatic Systems Lab	PC		0	0	2	10	15	0	0	1	25
TEE7402	0701270308	Smart Sensors and IoT Lab	PC		0	0	2	10	15	0	0	1	25
TEE7401	0701270309	Total Productive Maintenance	PC		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7851	0701270310	Introduction to Artificial Intelligence	PC		2	0	0	0	0	20	30	2	50
TEE7072	0701270311	Advanced Python Lab	PC		0	0	4	20	30	0	0	2	50
TEE7089	0701270312	Basics of Operating Systems	PC		2	0	0	0	0	50	0	2	50
TEE7088	0701270313	Basics of Operating Systems Lab	PC		0	0	2	10	15	0	0	1	25
T2646	0701270314	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
TH4788	0701270315	Health and Wellness Module I *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**13**	**0**	**16**	**80**	**120**	**220**	**105**	**21**	**525**
Generic Elective Courses Group (Choose any one Course)													
T6184	0701270316	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6186	0701270317	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6188	0701270318	Basic Spanish I	GE		2	0	0	0	0	50	0	2	50
				Total Required Credits				**0**	**0**	**50**	**0**	**2**	**50**
GIP													
G7001	0701270319	Global Immersion Programme			0	0	0	0	0	0	25	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Note: For students under Global Immersion Programme (0701270319), course "Entrepreneurship Venture" (0701270314) will be waived off.													
Semester : 4													
Generic Core Courses													
T8000	0701270401	Service Learning	HS		0	0	8	100	0	0	0	4	100
TE7852	0701270402	Kinematics and Dynamics of Robotics	PC		3	0	0	0	0	30	45	3	75
TE7853	0701270403	Kinematics and Dynamics of Robotics Lab	PC		0	0	2	10	15	0	0	1	25
TEE7399	0701270404	Programmable Logic Controller and Human Machine Interface	PC		2	0	0	0	0	50	0	2	50
TEE7400	0701270405	Programmable Logic Controller and Human Machine Interface Lab	PC		0	0	4	20	30	0	0	2	50
TEE7397	0701270406	Servo Motors and Drives	PC		1	0	0	0	0	25	0	1	25
TEE7398	0701270407	Servo Motors and Drives Lab	PC		0	0	2	10	15	0	0	1	25
TEE7071	0701270408	Application of Artificial Intelligence in Robotics and Automation	PC		2	0	0	0	0	20	30	2	50
TEE7070	0701270409	Application of Artificial Intelligence in Robotics and Automation Lab	PC		0	0	2	10	15	0	0	1	25
TE7674	0701270410	Applied Mathematics for Robotics	BS		3	0	0	0	0	75	0	3	75
TEE7395	0701270411	Process Control and Instrumentation	PC		2	0	0	0	0	50	0	2	50
TEE7396	0701270412	Process Control and Instrumentation Lab	PC		0	0	4	20	30	0	0	2	50

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TH4789	0701270413	Health and Wellness Module II *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
Total					**13**	**0**	**22**	**170**	**105**	**250**	**75**	**24**	**600**
Generic Elective Courses Group (Choose any one Course)													
T6872	0701270414	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25
T6760	0701270415	Introduction to Indian Philosophy	GE		1	0	0	0	0	25	0	1	25
Total Required Credits								**0**	**0**	**25**	**0**	**1**	**25**
Semester : 5													
Generic Core Courses													
T6749	0701270501	Design Thinking	HS		2	0	0	0	0	50	0	2	50
TEE7393	0701270502	Robotics	PC		2	0	0	0	0	50	0	2	50
TEE7394	0701270503	Robotics Lab	PC		0	0	4	20	30	0	0	2	50
TEE7392	0701270504	Software Automation Lab	PC		0	0	2	10	15	0	0	1	25
TEE7390	0701270505	Automation	PC		2	0	0	0	0	50	0	2	50
TEE7391	0701270506	Automation Lab	PC		0	0	4	20	30	0	0	2	50
TE7859	0701270507	Microcontroller and Embedded Systems	PC		2	0	0	0	0	20	30	2	50

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TEE7068	0701270508	Microcontroller and Embedded Systems Lab	PC		0	0	2	10	15	0	0	1	25
TE7836	0701270509	Computer Vision for Robotics	PC		3	0	0	0	0	30	45	3	75
TE7837	0701270510	Computer Vision for Robotics Lab	PC		0	0	4	20	30	0	0	2	50
SMC001	0701270549	*Vasudhaiva Kutumbakam* *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
Total					**11**	**0**	**16**	**80**	**120**	**200**	**75**	**19**	**475**
Generic Elective Courses Group (Choose any one Course)													
TE7892	0701270511	Theory of Universal Robots and Cobots	PE		3	0	0	0	0	30	45	3	75
TE7844	0701270512	Fundamentals of IOT and Cloud Computing	PE		3	0	0	0	0	30	45	3	75
TE7867	0701270513	Optimization for Robotics	PE		3	0	0	0	0	30	45	3	75
TE7832	0701270514	Building Automation	PE		3	0	0	0	0	30	45	3	75
TE7841	0701270515	Digital Signals	PE		3	0	0	0	0	30	45	3	75
TE7835	0701270516	Computational Fluid Dynamics with Artificial Intelligence	PE		3	0	0	0	0	30	45	3	75
TE7874	0701270517	Probabilistic Robotics	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Open Elective Courses Group (Choose any one Course)													
TE7698	0701270518	Nanotechnology	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7676	0701270519	Executive Corporate Communication For Impact	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7195	0701270520	GIS Applications	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7203	0701270521	Intelligent Transportation Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7297	0701270522	Software Testing Tools	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7756	0701270523	Open Source Technologies	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
T7584	0701270524	Printed Circuit Board (PCB) Design	OE	Electronics and Telecommunication Engineering	3	0	0	0	0	30	45	3	75
TE7334	0701270525	Introduction to Mechatronics	OE	Electronics and Telecommunication Engineering	3	0	0	0	0	30	45	3	75
TEE7044	0701270526	Data Modelling and Analytics for Battery Energy Storage Systems	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7351	0701270527	3D Printing and Prototyping	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**

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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		
Semester : 6													
Generic Core Courses													
TE7868	0701270601	Path Planning and Reinforcement Learning	PC		3	0	0	0	0	30	45	3	75
TE7869	0701270602	Path Planning and Reinforcement Learning Lab	PC		0	0	2	10	15	0	0	1	25
TE7290	0701270603	Project Based Learning -I	PIS		0	0	4	50	0	0	0	2	50
T7802	0701270604	Capstone Course	PC		2	0	0	0	0	50	0	2	50
T6774	0701270605	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
F0001	0701270606	Flexi-Credit Course	PC		1	0	0	0	0	25	0	1	25
TE7885	0701270607	Robotics Operating System	PC		2	0	0	0	0	20	30	2	50
TE7886	0701270608	Robotics Operating System Lab	PC		0	0	4	20	30	0	0	2	50
		Total			**10**	**0**	**10**	**80**	**45**	**175**	**75**	**15**	**375**
Generic Elective Group (Choose any one Group A to E) Generic Elective Course Group													
TE7862	0701270609	Mobile Application Development	PE		3	0	0	0	0	30	45	3	75
TE7863	0701270610	Mobile Application Development Lab	PE		0	0	2	10	15	0	0	1	25
		Total Required Credits						**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Course Group - B													
TE7848	0701270611	Industrial Internet of Things	PE		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7849	0701270612	Industrial Internet of Things Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - C													
TEE7067	0701270613	Introduction to Aerial Robotics	PE		3	0	0	0	0	30	45	3	75
TEE7066	0701270614	Introduction to Aerial Robotics Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - D													
TE7816	0701270615	Additive Manufacturing	PE		3	0	0	0	0	30	45	3	75
TE7817	0701270616	Additive Manufacturing Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - E													
TE7842	0701270617	Embedded System and Wireless Sensor Network	PE		3	0	0	0	0	30	45	3	75
TE7843	0701270618	Embedded System and Wireless Sensor Network Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Open Elective Courses Group (Choose any one Course)													
TE7677	0701270619	Financial Mathematics	OE	Applied Science	3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7700	0701270620	Smart Materials	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7223	0701270621	Smart Urban Planning	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7240	0701270622	Water Resource Planning and Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7948	0701270623	Introduction to Cloud Computing	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7952	0701270624	User Interface and Experience Design	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TEE7018	0701270625	Engineering Simulation and Modeling Tools	OE	Electronics and Telecommunication Engineering	3	0	0	0	0	30	45	3	75
TE7428	0701270626	Introduction to Image Processing	OE	Electronics and Telecommunication Engineering	3	0	0	0	0	30	45	3	75
TE7810	0701270627	Industrial Revolution and Introduction of Industry 5.0	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
T7650	0701270628	Six Sigma	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 7													
Generic Core Courses													
T7804	0701270701	Project	PIS		0	0	8	40	60	0	0	4	100
TE7877	0701270702	Robot System Design and Simulation	PC		3	0	0	0	0	30	45	3	75

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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		
TE7878	0701270703	Robot System Design and Simulation Lab	PC		0	0	4	20	30	0	0	2	50
F0003	0701270704	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
TE7876	0701270705	Responsible AI for Robotics	PC		1	0	0	0	0	25	0	1	25
F0001	0701270706	Flexi-Credit Course	PC		1	0	0	0	0	25	0	1	25
Total					**8**	**0**	**12**	**60**	**90**	**155**	**45**	**14**	**350**
Generic Elective Courses Group - I (Choose any one Course)													
TE7831	0701270707	Block Chain Technology For Robotics	PE		3	0	0	0	0	30	45	3	75
TE7875	0701270708	Reliability Engineering	PE		3	0	0	0	0	30	45	3	75
TE7854	0701270709	Lean Manufacturing	PE		3	0	0	0	0	30	45	3	75
TE7822	0701270710	Agile Development for Robotics Application	PE		3	0	0	0	0	30	45	3	75
TE7873	0701270711	Predictive Maintenance	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - II (Choose any one Course)													
TE7618	0701270712	Cyber Physical System	PE		3	0	0	0	0	30	45	3	75
TE7891	0701270713	Sustainable Development	PE		3	0	0	0	0	30	45	3	75
TE7827	0701270714	Augmented Reality and Virtual Reality Technology	PE		3	0	0	0	0	30	45	3	75

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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		
TE7861	0701270715	Mobile and Micro Robotics	PE		3	0	0	0	0	30	45	3	75
TE7623	0701270716	Theory of Innovative Design	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - III (Choose any one Course)													
T2585	0701270717	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50
TE7438	0701270718	History of Science and Technology	GE		2	0	0	0	0	50	0	2	50
Total Required Credits								**0**	**0**	**50**	**0**	**2**	**50**
Semester : 8													
Generic Core Courses													
T7912	0701270801	Internship	PIS		0	0	24	120	180	0	0	12	300
T7802	0701270802	Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					**0**	**0**	**28**	**140**	**210**	**0**	**0**	**14**	**350**

Abbreviations (Nature)	Description
BS	Basic Sciences
ES	Engineering Sciences
HS	Humanities and Social Sciences
OE	Open Electives
PC	Professional Core
PE	Professional Elective
PIS	Project, Internship, Seminar
PD	Professional Development Course
MC	Mandatory Course
L	Lecture
T	Tutorial
CA	Continuous Assessment
ESE	End Semester Examination
GE	Generic Elective

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Semester	Continuous Assessment	Term End Examination	Total Credits	Total Marks
Semester 1	3	17	20	500
Semester 2	5	14	19	475
Semester 3	8	15	23	575
Semester 4	13	12	25	625
Semester 5	6	19	25	625
Semester 6	7	15	22	550
Semester 7	7	15	22	550
Semester 8	0	14	14	350
Total	**49**	**121**	**170**	**4250**

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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													
Aerial Robotics and Drone Technology Specialisation Core Courses													
TE7850	0701270528	Introduction to Aerial Robotics and Drones	PC		3	0	0	0	0	30	45	3	75
TE7864	0701270529	Motion Planning and Control	PC		2	0	0	0	0	20	30	2	50
TE7865	0701270530	Motion Planning and Control lab	PC		0	0	2	10	15	0	0	1	25
				Total	**5**	**0**	**2**	**10**	**15**	**50**	**75**	**6**	**150**
Semester : 6													
Aerial Robotics and Drone Technology Specialisation Core Courses													
TE7884	0701270629	Robotics Mobility and Perception	PC		3	0	0	0	0	30	45	3	75
TE7883	0701270630	Robotics Estimation and Learning	PC		2	0	0	0	0	20	30	2	50
TE7866	0701270631	Navigation and Communication Lab	PC		0	0	4	20	30	0	0	2	50
				Total	**5**	**0**	**4**	**20**	**30**	**50**	**75**	**7**	**175**
Semester : 7													
Aerial Robotics and Drone Technology Specialisation Core Courses													
T7805	0701270719	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701270720	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50

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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		
				Total	0	0	14	70	105	0	0	7	175

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Annexure B
Optional 'Honours' Specialisation

Semester	Continuous Assessment	Term End Examination	Total Credits	Total Marks
Aerial Robotics and Drone Technology				
Semester 5	0	6	6	150
Semester 6	0	7	7	175
Semester 7	0	7	7	175
Total	**0**	**20**	**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	0701270531	Machine Learning: Classification	PC		3	0	0	0	0	30	45	3	75
TE7274	0701270532	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	0701270533	Open Source Tools for Data Science	PC		4	0	0	0	0	40	60	4	100
TE7292	0701270534	R Programming	PC		3	0	0	0	0	30	45	3	75
		Total			**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
Semester : 5													
Smart Cities and Urban Analytics Specialisation Core Courses													
TE7220	0701270535	Smart Cities : Context Policy and Governance	PC		3	0	0	0	0	30	45	3	75
TE7206	0701270536	IOT for Smart Cities	PC		3	0	0	0	0	30	45	3	75
TE7207	0701270537	IOT for Smart Cities Lab	PC		0	0	2	10	15	0	0	1	25

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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		
Total					**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 5													
Computing Specialisation Core Courses													
TE7248	0701270538	Cloud Computing	PC		3	0	0	0	0	30	45	3	75
TE7250	0701270539	Cloud Environment in Public Model	PC		3	0	0	0	0	30	45	3	75
Total					**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**
Semester : 5													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
TE7355	0701270540	Basics of Automotive Engineering	PC		3	0	0	0	0	30	45	3	75
TE7665	0701270541	Automotive Electronics and Instrumentation	PC		2	0	0	0	0	50	0	2	50
TE7666	0701270542	Automotive Vehicle Dynamics and NVH Lab	PC		0	0	2	10	15	0	0	1	25
Total					**5**	**0**	**2**	**10**	**15**	**80**	**45**	**6**	**150**
Semester : 5													
Computer Vision Specialisation Core Courses													
TE7328	0701270543	Image Processing	PC		3	0	0	0	0	30	45	3	75

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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		
TE7329	0701270544	Image Processing Lab	PC		0	0	2	10	15	0	0	1	25
T3560	0701270545	Computer Vision	PC		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 5													
Embedded Systems Specialisation Core Courses													
TEE7047	0701270546	Microcontrollers and Embedded C Programming	PC		3	0	0	0	0	30	45	3	75
TEE7046	0701270547	Microcontrollers and Embedded C Programming Lab	PC		0	0	2	10	15	0	0	1	25
TE7991	0701270548	Automotive Embedded System	PC		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 6													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
TE7266	0701270632	Introduction to Deep Learning	PC		4	0	0	0	0	40	60	4	100
TE7271	0701270633	Machine Learning Clustering and Retrieval	PC		3	0	0	0	0	30	45	3	75
				Total	**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
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		
Data Science Specialisation Core Courses													
TE7247	0701270634	Business Analytics	PC		3	0	0	0	0	30	45	3	75
TE7284	0701270635	Power BI	PC		3	0	0	0	0	30	45	3	75
		Total			**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**
Semester : 6													
Smart Cities and Urban Analytics Specialisation Core Courses													
TE7177	0701270636	Application of Sensor Technology to Smart Cities	PC		3	0	0	0	0	30	45	3	75
T7802	0701270637	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701270638	Specialization Seminar	PC		0	0	4	50	0	0	0	2	50
		Total			**3**	**0**	**8**	**100**	**0**	**30**	**45**	**7**	**175**
Semester : 6													
Computing Specialisation Core Courses													
TE7246	0701270639	Block Chain	PC		4	0	0	0	0	40	60	4	100
TE7249	0701270640	Cloud Computing Platforms	PC		3	0	0	0	0	30	45	3	75
		Total			**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**

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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		
Semester : 6													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
TE7669	0701270641	Hybrid Technology	PC		2	0	0	0	0	20	30	2	50
F0002	0701270642	Flexi-Credit Course	PC		2	0	0	0	0	50	0	2	50
TE7435	0701270643	Automotive Engine and Transmission System	PC		3	0	0	0	0	30	45	3	75
				Total	**7**	**0**	**0**	**0**	**0**	**100**	**75**	**7**	**175**
Semester : 6													
Computer Vision Specialisation Core Courses													
TEE7065	0701270644	Artificial Intelligence/Machine Learning based Computer Vision Techniques	PC		3	0	0	0	0	30	45	3	75
TEE7063	0701270645	Artificial Intelligence/Machine Learning based Computer Vision Techniques Lab	PC		0	0	2	10	15	0	0	1	25
TEE7064	0701270646	Object Detection and Tracking	PC		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 6													
Embedded Systems Specialisation Core Courses													

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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		
TEE7042	0701270647	Model Based Design	PC		3	0	0	0	0	30	45	3	75
TEE7040	0701270648	Model Based Design Laboratory	PC		0	0	2	10	15	0	0	1	25
TEE7048	0701270649	Embedded Cyber Security	PC		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 7													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
T7805	0701270719	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701270720	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													
Data Science Specialisation Core Courses													
T7805	0701270719	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701270720	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													

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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		
Smart Cities and Urban Analytics Specialisation Core Courses													
T7803	0701270721	Specialization Project	PIS		0	0	6	30	45	0	0	3	75
				Total	**0**	**0**	**6**	**30**	**45**	**0**	**0**	**3**	**75**
Specialisation Elective : Smart Cities and Urban Analytics (Choose any one course)													
TE7205	0701270722	Intelligent Transportation Systems	PE		3	0	0	0	0	30	45	3	75
TE7234	0701270723	Urban Hydrology and Hydraulics	PE		3	0	0	0	0	30	45	3	75
				Total Required Credits				**0**	**0**	**30**	**45**	**3**	**75**
Semester : 7													
Computing Specialisation Core Courses													
T7805	0701270719	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701270720	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
T7805	0701270719	Specialization Project	PIS		0	0	10	50	75	0	0	5	125

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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		
T7802	0701270720	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													
Computer Vision Specialisation Core Courses													
T7802	0701270724	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
T7804	0701270725	Specialization Seminar	PIS		0	0	8	40	60	0	0	4	100
				Total	**0**	**0**	**12**	**60**	**90**	**0**	**0**	**6**	**150**
Semester : 7													
Embedded Systems Specialisation Core Courses													
T7802	0701270724	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
T7804	0701270725	Specialization Seminar	PIS		0	0	8	40	60	0	0	4	100
				Total	**0**	**0**	**12**	**60**	**90**	**0**	**0**	**6**	**150**

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Semester	Continuous Assessment	Term End Examination	Total Credits	Total Marks
Artificial Intelligence and Machine Learning				
Semester 5	0	6	6	150
Semester 6	0	7	7	175
Semester 7	0	7	7	175
Total	**0**	**20**	**20**	**500**
Data Science				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	**0**	**20**	**20**	**500**
Smart Cities and Urban Analytics				
Semester 5	0	7	7	175
Semester 6	4	3	7	175
Semester 7	0	6	6	150
Total	**4**	**16**	**20**	**500**
Computing				
Semester 5	0	6	6	150
Semester 6	0	7	7	175
Semester 7	0	7	7	175
Total	**0**	**20**	**20**	**500**
Automobile Engineering with Hybrid and Autonomous Technology				
Semester 5	2	4	6	150
Semester 6	2	5	7	175

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Semester 7	0	7	7	175
Total	**4**	**16**	**20**	**500**
Computer Vision				
Semester 5	0	7	7	175
Semester 6	0	7	7	175
Semester 7	0	6	6	150
Total	**0**	**20**	**20**	**500**
Embedded Systems				
Semester 5	0	7	7	175
Semester 6	0	7	7	175
Semester 7	0	6	6	150
Total	**0**	**20**	**20**	**500**