



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

1. OBJECTIVE	<p>B.Tech 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.</p> <p>Being a professional programme it ensures a healthy balance between theoretical foundation and practical exposure to the present day world.</p> <p>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.</p>			
2. DURATION (IN MONTHS)	48 (Full Time)			
3. INTAKE	120			
4. RESERVATION	I. Within the sanctioned intake	a) SC (In Percentage)	b) ST (In Percentage)	c) Differently abled (In Percentage)
		15	7.5	3
	II. Over and above the sanctioned intake	a) Kashmiri Migrants (In Seats)		b) International Students (In Percentage)
		2		15
5. ELIGIBILITY	<p>Passed 10+2 examination with Physics and Mathematics as compulsory subjects along with one of Chemistry/ Biotechnology/ Biology/ Technical Vocational subjects. Obtained at least 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste /Scheduled Tribes) in the above subjects taken together.</p> <p>B. Tech (Lateral entry to second year) :</p> <p>a) Passed Diploma examination from an AICTE approved Institution; with at least 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste /Scheduled Tribes) in appropriate branch of Engineering / Technology.</p>			





Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

		<p>b) Passed B.Sc. Degree from a recognized University as defined by UGC, with at least 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste /Scheduled Tribes) and passed XII standard with mathematics as a subject.</p> <p>c) Provided that in case of students belonging to B. Sc. Stream, shall clear the subjects of Engineering Graphics / Engineering Drawing and Engineering Mechanics of the first year Engineering program along with the second year subjects.</p> <p>d) Provided further that, the students belonging to B. Sc. Stream shall be considered only after filling the supernumerary seats in this category with students belonging to the Diploma stream.</p> <p>e) Provided further that students, who have passed Diploma in Engineering and Technology from an AICTE approved Institution or B. Sc. Degree from a recognized University as defined by UGC, shall also be eligible for admission to the first year Engineering Degree courses subject to vacancies in the first year class in case the vacancies at lateral entry are exhausted. However the admissions shall be based strictly on the eligibility criteria as mentioned in a, b, c, and d above.</p>
6.	SELECTION PROCEDURE	Merit list by a valid score of Symbiosis Entrance Test (SIT EEE) or Joint Entrance Examination (JEE - Mains) or Any States Engineering Entrance Test.
7.	MEDIUM OF INSTRUCTION	English
8.	PROGRAMME PATTERN	Semester
9.	COURSE & SPECIALIZATION	<p>Annexure A: Bachelor of Technology (Electronics and Tele-Communication Engineering) 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.</p> <p>Annexure B: Optional 'Honours' specialization area</p> <ol style="list-style-type: none"> 1. Bioelectronics Systems 2. Embedded Systems 3. Mechatronics and Automation 4. Optoelectronics and Communication 5. Signal Processing 6. Sustainable Energy Devices and Systems





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Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

		Annexure C: Optional 'Minor' specialization area 1.Artificial Intelligence and Machine Learning (CSE) 2.Data Science (CSE) 3.Internet of Things (CSE) 4.Smart Cities and Urban Analytics (CE) 5.Automobile Engineering with Hybrid and Autonomous Technology (ME)			
10.	FEE		Academic Fee p.a	Institute Deposit	Total
		Indian Students	260000	20000	280000
		International Students (USD equivalent to INR)	390000	20000	410000
Note: For additional optional specialization 'Honours' or 'Minor', an additional fees of Rs. 25000/- will be charged in the third year.					
11.	ASSESSMENT	All internal courses will have 100% component as internal evaluation at the institute level. All external courses will have 40% internal component and 60% component as external [University] examination. The internal and external will be separate heads of passing.			
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/ DIPLOMA/ CERTIFICATE	Bachelor of Technology (Electronics and Tele-Communication Engineering) OR Bachelor of Technology (Electronics and Tele-Communication Engineering) with Honours in Bioelectronics Systems / Embedded Systems / Mechatronics and Automation / Optoelectronics and Communication / Signal Processing / Sustainable Energy Devices and Systems. OR			



Bachelor of (Electronics and Tele-Communication Engineering) with Minor in Artificial Intelligence and Machine Learning /Data Science / Internet of Things / Smart Cities and Urban Analytics / Automobile Engineering with Hybrid and Autonomous Technology will be awarded at the end of semester VIII 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	Specialization Core	Specialization Elective	Open Elective	Audit	Total
1	19	0	0	0	0	1*	19
2	21	0	0	0	0	1*	21
3	19	1	0	0	0	0	20
4	22	2	0	0	0	1*	24
5	22	6	0	0	0	0	28
6	16	4	0	0	3	0	23
7	8	10	0	0	3	0	21
8	14	0	0	0	0	0	14
Total	141	23	0	0	6	0	170
Optional Additional Courses (Honours)							
Total	0	0	20	0	0	0	20
Optional Additional Courses (Minor)							
Total	0	0	20/17	0/3	0	0	20
Grand Total							190

* Satisfactory completion of the non letter grade course 'Integrated Disaster Management', 'Fitness for Life' and 'Certificate in COVID-19 Care for the Community' is mandatory for the award of degree.

The revised programme structure supersedes the previously approved programme structure dated 08/08/2023 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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Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure A

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 1													
Generic Core Courses													
TE7168	0701230101	Engineering Mathematics -I	BS		3	1	0	0	0	40	60	4	100
T7391	0701230102	Physics	BS		3	0	0	0	0	30	45	3	75
T7392	0701230103	Physics lab	BS		0	0	2	10	15	0	0	1	25
T7383	0701230104	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	0701230105	Communication skills lab	HS		0	0	2	10	15	0	0	1	25
TE7188	0701230106	Environmental Science	ES		2	0	0	0	0	20	30	2	50
TE7286	0701230107	Programming and Problem Solving	ES		2	0	0	0	0	20	30	2	50
TE7287	0701230108	Programming and Problem Solving Lab	ES		0	0	2	10	15	0	0	1	25
TE7310	0701230109	Computational Techniques I	ES		2	0	0	0	0	50	0	2	50
T6773	0701230110	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
TH4272	0701230111	Certificate in COVID-19 Care for the Community *			0	0	0	0	0	0	0	Non - Letter Grade	0
Total					15	1	6	30	45	205	195	19	475
Semester : 2													
Generic Core Courses													
TE7169	0701230201	Engineering Mathematics -II	BS		3	1	0	0	0	40	60	4	100



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Programme Structure 2021-25

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
T7540	0701230202	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	0701230203	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
T7381	0701230204	Chemistry	BS		3	0	0	0	0	30	45	3	75
T7382	0701230205	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
TE7311	0701230206	Computational Techniques II	ES		3	0	0	0	0	75	0	3	75
T7925	0701230207	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
T6732	0701230208	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
TE7396	0701230209	Software Tools	ES		0	0	2	25	0	0	0	1	25
TE7300	0701230210	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
TH4095	0701230211	Fitness for Life *			0	0	0	0	0	0	0	Non - Letter Grade	0
Total					13	1	14	115	60	200	150	21	525
Semester : 3													
Generic Core Courses													
TE7170	0701230301	Engineering Mathematics-III	BS		2	1	0	0	0	30	45	3	75
TE7083	0701230302	Signals and Systems	PC		3	0	0	0	0	30	45	3	75
TE7320	0701230303	Electronic Devices and Circuits	PC		3	0	0	0	0	30	45	3	75
TE7321	0701230304	Electronic Devices and Circuits Lab	PC		0	0	2	10	15	0	0	1	25



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Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

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								CA	ESE	CA	ESE		
TE7336	0701230305	Network Theory	PC		3	0	0	0	0	30	45	3	75
T2646	0701230306	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
TE7322	0701230307	Electronic Measurements Lab	PC		0	0	2	10	15	0	0	1	25
F7011	0701230308	Digital Circuits and Logic Design	PC		4	0	0	0	0	100	0	4	100
Total					16	1	4	20	30	245	180	19	475
Generic Elective Course Group													
T6760	0701230309	Introduction to Indian Philosophy	GE		1	0	0	0	0	25	0	1	25
T6872	0701230310	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25
Total Required Credits								0	0	25	0	1	25
Semester : 4													
Generic Core Courses													
T7547	0701230401	Control Systems	PC		3	1	0	0	0	40	60	4	100
T7548	0701230402	Control Systems Lab	PC		0	0	2	10	15	0	0	1	25
T7562	0701230403	Electromagnetic Field Theory	PC		3	1	0	0	0	40	60	4	100
TE7084	0701230404	Analog Circuit Design	PC		3	0	0	0	0	30	45	3	75
T7536	0701230405	Analog Circuit Design Lab	PC		0	0	2	10	15	0	0	1	25
TE7290	0701230406	Project Based Learning -I	PIS		0	0	4	50	0	0	0	2	50
F7023	0701230407	Data Structures Using C	PC		3	0	0	0	0	75	0	3	75



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Programme Structure 2021-25

Annexure A

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
T8000	0701230408	Service Learning	HS		0	0	8	100	0	0	0	4	100
T4005	0701230409	Integrated Disaster Management *			0	0	0	0	0	0	0	Non - Letter Grade	0
Total					12	2	16	170	30	185	165	22	550
Generic Elective Course Group													
T6184	0701230410	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6186	0701230411	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6188	0701230412	Basic Spanish I	GE		2	0	0	0	0	50	0	2	50
Total Required Credits								0	0	50	0	2	50
GIP													
G7002	0701230413	Global Immersion Programme			0	0	0	0	0	0	50	2	50
Note: For students under Global Immersion Programme (0701230413), course "Basic French I" (0701230411) will be waived off.													
Semester : 5													
Generic Core Courses													
T7558	0701230501	Digital Signal Processing	PC		3	1	0	0	0	40	60	4	100
T7559	0701230502	Digital Signal Processing Lab	PC		0	0	2	10	15	0	0	1	25



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Programme Structure 2021-25

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7425	0701230503	Principles of Communication	PC		3	0	0	0	0	30	45	3	75
TE7029	0701230504	Principles of Communication Lab	PC		0	0	2	10	15	0	0	1	25
TE7316	0701230505	Digital Communication	PC		3	0	0	0	0	30	45	3	75
T7552	0701230506	Digital Communication Lab	PC		0	0	2	10	15	0	0	1	25
TE7174	0701230507	Probability, Random Variables and Stochastic Process	PC		3	0	0	0	0	30	45	3	75
TE7291	0701230508	Project Based Learning-II	PIS		0	0	4	50	0	0	0	2	50
F7026	0701230509	Microcontrollers and Applications	PC		2	0	0	0	0	50	0	2	50
T6749	0701230510	Design Thinking	HS		2	0	0	0	0	50	0	2	50
Total					16	1	10	80	45	230	195	22	550
Generic Elective Courses Group - I													
TE7090	0701230511	Antenna and Wave Propagation	PE		3	0	0	0	0	30	45	3	75
TE7323	0701230512	Electronic System Design	PE		3	0	0	0	0	30	45	3	75
TE7085	0701230513	Power Electronics	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group - II													
TE7091	0701230514	Antenna and Wave Propagation Lab	PE		0	0	2	10	15	0	0	1	25
TE7324	0701230515	Electronic System Design Lab	PE		0	0	2	10	15	0	0	1	25
T7583	0701230516	Power Electronics Lab	PE		0	0	2	10	15	0	0	1	25



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Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure A

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					L	T	La b	Practical		Theory						
								CA	ESE	CA	ESE					
Total Required Credits								10	15	0	0	1	25			
Generic Elective Courses Group - III																
TE7438	0701230517	History of Science and Technology	GE		2	0	0	0	0	50	0	2	50			
T2585	0701230518	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50			
Total Required Credits								0	0	50	0	2	50			
Semester : 6																
Generic Core Courses																
T7908	0701230601	Computer Networks	PC		3	0	0	0	0	30	45	3	75			
T7482	0701230602	Computer Networks Lab	PC		0	0	2	10	15	0	0	1	25			
T7802	0701230603	Project Based Learning-III	PIS		0	0	4	50	0	0	0	2	50			
TE7426	0701230604	Electronic Design Workshop	PC		0	0	4	20	30	0	0	2	50			
T7802	0701230605	Capstone Course	PC		2	0	0	0	0	50	0	2	50			
T6774	0701230606	Principles of Economics	HS		2	0	0	0	0	50	0	2	50			
F7058	0701230607	Digital Design with Verilog	PC		4	0	0	0	0	100	0	4	100			
Total								11	0	10	80	45	230	45	16	400
Generic Elective Courses Group - I																
T7580	0701230608	Microwaves and Radar	PE		3	0	0	0	0	30	45	3	75			
TE7089	0701230609	Modern Control Theory	PE		3	0	0	0	0	30	45	3	75			
TE7427	0701230610	Embedded System Design	PE		3	0	0	0	0	30	45	3	75			



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Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure A

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7088	0701230611	Digital Image Processing	PE		3	0	0	0	0	30	45	3	75
TE7315	0701230612	Digital CMOS VLSI Design	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group - II													
T7579	0701230613	Microwave and Radar Lab	PE		0	0	2	10	15	0	0	1	25
TE7039	0701230614	Modern Control Theory Lab	PE		0	0	2	10	15	0	0	1	25
T7567	0701230615	Embedded System Design Lab	PE		0	0	2	10	15	0	0	1	25
T7094	0701230616	Digital Image Processing Lab	PE		0	0	2	10	15	0	0	1	25
TE7132	0701230617	CAD for VLSI Design Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								10	15	0	0	1	25
Open Elective Courses Group													
TEE7018	0701230618	Engineering Simulation and Modeling Tools	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7335	0701230619	Introduction to Robotics	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7339	0701230620	Renewable Energy Systems	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure A

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7428	0701230621	Introduction to Image Processing	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7223	0701230622	Smart Urban Planning	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7240	0701230623	Water Resource Planning and Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
T7499	0701230624	Java	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7265	0701230625	Introduction to Data Science	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7263	0701230626	Introduction to AI and Machine Learning	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7388	0701230627	Quality Management Techniques	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7319	0701230628	Electrical and Electronics Materials	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7351	0701230629	3D Printing and Prototyping	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7387	0701230630	Project Management	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7698	0701230631	Nanotechnology	OE	Applied Science	3	0	0	0	0	30	45	3	75
T7393	0701230632	Computer Based Statistical Packages	OE	Applied Science	3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 7													
Generic Core Courses													



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Programme Structure 2021-25

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
T7804	0701230701	B.Tech Project	PIS		0	0	8	40	60	0	0	4	100
T7674	0701230702	Cyber Security	PC		2	0	0	0	0	50	0	2	50
F0002	0701230703	Flexi-Credit Course	PC		2	0	0	0	0	50	0	2	50
Total					4	0	8	40	60	100	0	8	200
Generic Elective Courses Group - I													
T7473	0701230704	Artificial Intelligence	PE		3	0	0	0	0	30	45	3	75
TE7045	0701230705	IoT and Applications	PE		3	0	0	0	0	30	45	3	75
TE7326	0701230706	Fiber Optics And Satellite Communication	PE		3	0	0	0	0	30	45	3	75
TE7340	0701230707	Scientific Computing	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group - II													
TE7014	0701230708	Artificial Intelligence Lab	PE		0	0	2	10	15	0	0	1	25
TE7048	0701230709	IoT and Applications Lab	PE		0	0	2	10	15	0	0	1	25
TE7327	0701230710	Fiber Optics And Satellite Communication Lab	PE		0	0	2	10	15	0	0	1	25
TE7341	0701230711	Scientific Computing Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								10	15	0	0	1	25
Generic Elective Courses Group - III													
TE7306	0701230712	Biomedical Electronics	PE		3	0	0	0	0	30	45	3	75



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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7317	0701230713	Digital Control System	PE		3	0	0	0	0	30	45	3	75
TE7342	0701230714	Speech and Audio Signal Processing	PE		3	0	0	0	0	30	45	3	75
TE7347	0701230715	Wireless Communication	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group - IV													
TE7307	0701230716	Biomedical Electronics Lab	PE		0	0	2	10	15	0	0	1	25
TE7318	0701230717	Digital Control System Lab	PE		0	0	2	10	15	0	0	1	25
TE7343	0701230718	Speech and Audio Signal Processing Lab	PE		0	0	2	10	15	0	0	1	25
TE7348	0701230719	Wireless Communication Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								10	15	0	0	1	25
Generic Elective Courses Group - V													
TE7429	0701230720	Information Theory and Coding	PE		2	0	0	0	0	20	30	2	50
TE7430	0701230721	Computer Architecture	PE		2	0	0	0	0	20	30	2	50
TE7431	0701230722	Wireless Sensor Network	PE		2	0	0	0	0	20	30	2	50
Total Required Credits								0	0	20	30	2	50
Open Elective Courses Group													
TE7171	0701230723	Introduction to Mathematical Modelling	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7195	0701230724	GIS Applications	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7203	0701230725	Intelligent Transportation Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure A

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7264	0701230726	Introduction to BIGDATA	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
T7474	0701230727	Basics of Database	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
T7616	0701230728	Fundamentals of Automotive Technology	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
T7529	0701230729	Machine Learning	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7756	0701230730	Open Source Technologies	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
T7584	0701230731	Printed Circuit Board (PCB) Design	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
T7650	0701230732	Six sigma	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7700	0701230733	Smart Materials	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7334	0701230734	Introduction to Mechatronics	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7338	0701230735	Principles of Modern Communication Systems	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7376	0701230736	Introduction to Operations Research	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure A

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7377	0701230737	Introduction to Optimisation	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 8													
Generic Core Courses													
T7912	0701230801	Internship	PIS		0	0	24	120	180	0	0	12	300
T7802	0701230802	Seminar	PIS		0	0	4	50	0	0	0	2	50
Total					0	0	28	170	180	0	0	14	350



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure A

Abbreviations (Nature)

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



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25
Annexure A

Semester	Internal Credits	External Credits	Total Credits	Total Marks
Semester 1	3	16	19	475
Semester 2	7	14	21	525
Semester 3	6	14	20	500
Semester 4	11	13	24	600
Semester 5	8	20	28	700
Semester 6	10	13	23	575
Semester 7	4	17	21	525
Semester 8	2	12	14	350
Total	51	119	170	4250



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure B
Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 5													
Bioelectronics Systems Specialization Core Courses													
TE7333	0701230519	Introduction to Computer Vision	PC		4	0	0	0	0	40	60	4	100
T7801	0701230520	Specialization Project	PIS		0	0	2	10	15	0	0	1	25
T7802	0701230521	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					4	0	6	30	45	40	60	7	175
Semester : 5													
Embedded Systems Specialization Core Courses													
T7801	0701230520	Specialization Project	PIS		0	0	2	10	15	0	0	1	25
T7802	0701230521	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
TE7298	0701230522	System Programming	PC		4	0	0	0	0	40	60	4	100
Total					4	0	6	30	45	40	60	7	175
Semester : 5													
Mechatronics and Automation Specialization Core Courses													
T7801	0701230520	Specialization Project	PIS		0	0	2	10	15	0	0	1	25
T7802	0701230521	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure B
Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7330	0701230523	Industrial Robotics	PC		4	0	0	0	0	40	60	4	100
Total					4	0	6	30	45	40	60	7	175
Semester : 5													
Optoelectronics and Communication Specialization Core Courses													
T7801	0701230520	Specialization Project	PIS		0	0	2	10	15	0	0	1	25
T7802	0701230521	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
TE7345	0701230524	Theory of Light and Lasers	PC		4	0	0	0	0	40	60	4	100
Total					4	0	6	30	45	40	60	7	175
Semester : 5													
Signal Processing Specialization Core Courses													
T7801	0701230520	Specialization Project	PIS		0	0	2	10	15	0	0	1	25
T7802	0701230521	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
T7086	0701230525	Advanced Digital Signal Processing	PC		4	0	0	0	0	40	60	4	100
Total					4	0	6	30	45	40	60	7	175
Semester : 5													



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure B
Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Sustainable Energy Devices and Systems Specialization Core Courses													
T7801	0701230520	Specialization Project	PIS		0	0	2	10	15	0	0	1	25
T7802	0701230521	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
TE7344	0701230526	Sustainable Energy And Solar Photovoltaic Systems	PC		4	0	0	0	0	40	60	4	100
Total					4	0	6	30	45	40	60	7	175
Semester : 6													
Bioelectronics Systems Specialization Core Courses													
TE7308	0701230633	Biomedical Imaging Systems	PC		4	0	0	0	0	40	60	4	100
T7802	0701230634	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
Total					4	0	4	20	30	40	60	6	150
Semester : 6													
Embedded Systems Specialization Core Courses													
T7802	0701230634	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7325	0701230635	Embedded Linux	PC		4	0	0	0	0	40	60	4	100
Total					4	0	4	20	30	40	60	6	150



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure B
Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 6													
Mechatronics and Automation Specialization Core Courses													
T7802	0701230634	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
T7100	0701230636	Mechatronics	PC		4	0	0	0	0	40	60	4	100
Total					4	0	4	20	30	40	60	6	150
Semester : 6													
Optoelectronics and Communication Specialization Core Courses													
T7802	0701230634	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7337	0701230637	Optical Devices and Fiber Optics	PC		4	0	0	0	0	40	60	4	100
Total					4	0	4	20	30	40	60	6	150
Semester : 6													
Signal Processing Specialization Core Courses													
T7802	0701230634	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
T7112	0701230638	VLSI Digital Signal Processing System	PC		4	0	0	0	0	40	60	4	100
Total					4	0	4	20	30	40	60	6	150



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure B
Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 6													
Sustainable Energy Devices and Systems Specialization Core Courses													
T7802	0701230634	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7346	0701230639	Wind Energy Systems	PC		4	0	0	0	0	40	60	4	100
Total					4	0	4	20	30	40	60	6	150
Semester : 7													
Bioelectronics Systems Specialization Core Courses													
TE7050	0701230738	Biomedical Instrumentation	PC		4	0	0	0	0	40	60	4	100
T7802	0701230740	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7309	0701230739	Biomedical Instrumentation Lab	PC		0	0	2	10	15	0	0	1	25
Total					4	0	6	30	45	40	60	7	175
Semester : 7													
Embedded Systems Specialization Core Courses													
T7802	0701230740	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7304	0701230741	Advanced Microcontrollers and RTOS	PC		4	0	0	0	0	40	60	4	100
TE7305	0701230742	Advanced Microcontrollers and RTOS Lab	PC		0	0	2	10	15	0	0	1	25



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure B
Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Total					4	0	6	30	45	40	60	7	175
Semester : 7													
Mechatronics and Automation Specialization Core Courses													
T7802	0701230740	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7125	0701230743	Mobile Robotics	PC		4	0	0	0	0	40	60	4	100
TE7056	0701230744	Mobile Robotics Lab	PC		0	0	2	10	15	0	0	1	25
Total					4	0	6	30	45	40	60	7	175
Semester : 7													
Optoelectronics and Communication Specialization Core Courses													
T7802	0701230740	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7432	0701230745	Optical Communication Systems	PC		4	0	0	0	0	40	60	4	100
TE7433	0701230746	Optical Communication Systems Lab	PC		0	0	2	10	15	0	0	1	25
Total					4	0	6	30	45	40	60	7	175
Semester : 7													
Signal Processing Specialization Core Courses													



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure B
Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
T7802	0701230740	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7302	0701230747	Adaptive Signal Processing	PC		4	0	0	0	0	40	60	4	100
TE7303	0701230748	Adaptive Signal Processing Lab	PC		0	0	2	10	15	0	0	1	25
Total					4	0	6	30	45	40	60	7	175
Semester : 7													
Sustainable Energy Devices and Systems Specialization Core Courses													
T7802	0701230740	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7313	0701230749	Devices and Grid Systems for Sustainable Energy	PC		4	0	0	0	0	40	60	4	100
TE7314	0701230750	Devices and Grid Systems for Sustainable Energy Lab	PC		0	0	2	10	15	0	0	1	25
Total					4	0	6	30	45	40	60	7	175



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure B
Optional 'Honours' Specialization

Semester	Internal Credits	External Credits	Total Credits	Total Marks
Bioelectronics Systems				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	0	20	20	500
Embedded Systems				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	0	20	20	500
Mechatronics and Automation				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	0	20	20	500
Optoelectronics and Communication				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	0	20	20	500
Signal Processing				
Semester 5	0	7	7	175
Semester 6	0	6	6	150



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure B
Optional 'Honours' Specialization

Semester 7	0	7	7	175
Total	0	20	20	500
Sustainable Energy Devices and Systems				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	0	20	20	500



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 5													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TE7273	0701230527	Machine Learning: Classification	PC		3	0	0	0	0	30	45	3	75
TE7274	0701230528	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 Specialization Core Courses													
TE7281	0701230529	Open Source Tools for Data Science	PC		4	0	0	0	0	40	60	4	100
TE7292	0701230530	R Programming	PC		3	0	0	0	0	30	45	3	75
Total					7	0	0	0	0	70	105	7	175
Semester : 5													
Internet of Things Specialization Core Courses													
TE7268	0701230531	Introduction to IOT	PC		4	0	0	0	0	40	60	4	100
TE7293	0701230532	Raspberry Pi and Python	PC		3	0	0	0	0	30	45	3	75
Total					7	0	0	0	0	70	105	7	175



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 5													
Smart Cities and Urban Analytics Specialization Core Courses													
TE7220	0701230533	Smart Cities : Context Policy and Governance	PC		3	0	0	0	0	30	45	3	75
TE7206	0701230534	IOT for Smart Cities	PC		3	0	0	0	0	30	45	3	75
TE7207	0701230535	IOT for Smart Cities Lab	PC		0	0	2	10	15	0	0	1	25
Total					6	0	2	10	15	60	90	7	175
Semester : 5													
Automobile Engineering with Hybrid and Autonomous Technology Specialization Core Courses													
TE7355	0701230536	Basics of Automotive Engineering	PE		3	0	0	0	0	30	45	3	75
TE7665	0701230537	Automotive Electronics and Instrumentation	PE		2	0	0	0	0	50	0	2	50
TE7666	0701230538	Automotive Vehicle Dynamics and NVH Lab	PE		0	0	2	10	15	0	0	1	25
Total					5	0	2	10	15	80	45	6	150
Semester : 6													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TE7266	0701230640	Introduction to Deep Learning	PC		4	0	0	0	0	40	60	4	100
TE7271	0701230641	Machine Learning Clustering and Retrieval	PC		3	0	0	0	0	30	45	3	75



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Total					7	0	0	0	0	70	105	7	175
Semester : 6													
Data Science													
Specialization Core Courses													
TE7247	0701230642	Business Analytics	PC		3	0	0	0	0	30	45	3	75
TE7284	0701230643	Power BI	PC		3	0	0	0	0	30	45	3	75
Total					6	0	0	0	0	60	90	6	150
Semester : 6													
Internet of Things													
Specialization Core Courses													
TE7269	0701230644	IOT Security and Privacy	PC		3	0	0	0	0	30	45	3	75
TE7295	0701230645	Software Defined Networking	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													
Specialization Core Courses													
T7802	0701230646	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701230647	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7177	0701230648	Application of Sensor Technology to Smart Cities	PC		3	0	0	0	0	30	45	3	75
Total					3	0	8	100	0	30	45	7	175
Semester : 6													
Automobile Engineering with Hybrid and Autonomous Technology													
Specialization Core Courses													
TE7669	0701230649	Hybrid Technology	PC		2	0	0	0	0	20	30	2	50
F7079	0701230650	Self Driven Cars	PC		2	0	0	0	0	50	0	2	50
TE7435	0701230651	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 : 7													
Artificial Intelligence and Machine Learning													
Specialization Core Courses													
T7805	0701230751	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701230752	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													
Specialization Core Courses													



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
T7805	0701230751	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701230752	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					0	0	14	70	105	0	0	7	175
Semester : 7													
Internet of Things													
Specialization Core Courses													
T7805	0701230751	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701230752	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					0	0	14	70	105	0	0	7	175
Semester : 7													
Smart Cities and Urban Analytics													
Specialization Core Courses													
T7803	0701230753	Specialization Project	PIS		0	0	6	30	45	0	0	3	75
Total					0	0	6	30	45	0	0	3	75
Smart Cities and Urban Analytics Specialization Elective Courses Group													
TE7205	0701230754	Intelligent Transportation Systems	PE		3	0	0	0	0	30	45	3	75
TE7234	0701230755	Urban Hydrology and Hydraulics	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Electronics & Tele-Communication Engineering)
Programme Structure 2021-25

Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 7													
Automobile Engineering with Hybrid and Autonomous Technology													
Specialization Core Courses													
T7805	0701230756	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701230757	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					0	0	14	70	105	0	0	7	175



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Semester	Internal Credits	External Credits	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
Internet of Things				
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
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