Symbiosis Institute of Technology, Pune
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<table>
<tr><td>1.</td><td>OBJECTIVE</td><td colspan="4">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.
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="2">4.</td><td rowspan="2">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"></td><td rowspan="2"></td><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>15</td></tr>
<tr><td>5.</td><td>ELIGIBILITY</td><td colspan="4">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.
B. Tech (Lateral entry to second year) :
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.</td></tr>
</table>

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		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. 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. 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. 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.
6.	**SELECTION PROCEDURE**	Merit list by a valid score of Symbiosis Entrance Test (SIT EEE) or Joint Entrance Examination (JEE - Mains) or All States Engineering Entrance Test.
7.	**MEDIUM OF INSTRUCTION**	English
8.	**PROGRAMME PATTERN**	Semester
9.	**COURSE & SPECIALIZATION**	Annexure A: Bachelor of Technology (Information Technology) 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. Artificial Intelligence and Machine Learning 2. Computing 3. Data Science 4. Game Design & Development 5. Security and Privacy 6. Internet of Things Annexure C: Optional 'Minor' specialization area

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		1. Automobile Engineering With Hybrid And Autonomous Technology (ME) 2. Embedded Systems (E&TC) 3. Smart Cities and Urban Analytics (CE)			
10.	**FEE**		**Academic Fee p.a**	**Institute Deposit**	**Total**
		Indian Students	260000	20000	280000
		International Students (USD equivalent to INR)	390000	20000	410000
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 (Information Technology) OR Bachelor of Technology (Information Technology) with Honours in Artificial Intelligence and Machine Learning / Computing / Data Science / Game Design & Development / Security and Privacy /Internet of Things. OR Bachelor of Technology (Information Technology) with Minor in Automobile Engineering with Hybrid and Autonomous Technology (ME)/ Embedded Systems (E&TC) /Smart Cities and Urban Analytics (CE) 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	18	0	0	0	0	0	18
2	20	0	0	0	1	0	21
3	24	0	0	0	0	2*	24
4	17	2	0	0	0	1*	19
5	22	0	0	0	3	0	25
6	12	10	0	0	3	0	25
7	13	11	0	0	0	0	24
8	14	0	0	0	0	0	14
Total	**140**	**23**	**0**	**0**	**7**	**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.

Note: For additional specializations (optional) as applicable, fees of Rs.25000/- will be charged, additionally in the third year

The revised programme structure supersedes the previously approved programme structure dated 21/03/2023 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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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	Lab	CA	ESE	CA	ESE		
Semester : 1													
Generic Core Courses													
TE7168	0701240101	Engineering Mathematics -I	BS		3	1	0	0	0	40	60	4	100
T7391	0701240102	Physics	BS		3	0	0	0	0	30	45	3	75
T7392	0701240103	Physics lab	BS		0	0	2	10	15	0	0	1	25
TE7288	0701240104	Programming in C	PC		3	0	0	0	0	30	45	3	75
TE7289	0701240105	Programming in C Lab	PC		0	0	2	10	15	0	0	1	25
T7383	0701240106	Communication Skills	HS		2	0	0	0	0	20	30	2	50
TE7139	0701240107	Communication Skills Lab	HS		0	0	2	10	15	0	0	1	25
TE7188	0701240108	Environmental Science	ES		2	0	0	0	0	20	30	2	50
T6773	0701240109	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
				Total	**14**	**1**	**6**	**30**	**45**	**165**	**210**	**18**	**450**
Semester : 2													
Generic Core Courses													
TE7169	0701240201	Engineering Mathematics -II	BS		3	1	0	0	0	40	60	4	100
T7540	0701240202	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	0701240203	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
T7381	0701240204	Chemistry	BS		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7382	0701240205	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
TE7286	0701240206	Programming and Problem Solving	ES		2	0	0	0	0	20	30	2	50
TE7287	0701240207	Programming and Problem Solving Lab	ES		0	0	2	10	15	0	0	1	25
T7925	0701240208	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
T6732	0701240209	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
TE7396	0701240210	Software Tools	PC		0	0	2	25	0	0	0	1	25
T2646	0701240211	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
				Total	**13**	**1**	**12**	**75**	**75**	**170**	**180**	**20**	**500**
Open Elective Course Group													
T6761	0701240212	Foundation of Ethics	OE		1	0	0	0	0	25	0	1	25
T6760	0701240213	Introduction to Indian Philosophy	OE		1	0	0	0	0	25	0	1	25
				Total Required Credits				**0**	**0**	**25**	**0**	**1**	**25**
Semester : 3													
Generic Core Courses													
T7995	0701240301	Discrete Mathematics and Probability Theory	BS		3	1	0	0	0	40	60	4	100
T7906	0701240302	Fundamentals of Data Structures	PC		3	0	0	0	0	30	45	3	75
TE7257	0701240303	Fundamentals of Data Structures Lab	PC		0	0	2	10	15	0	0	1	25
T7512	0701240304	Programming Paradigms	PC		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7513	0701240305	Programming Paradigms Lab	PC		0	0	2	10	15	0	0	1	25
T7997	0701240306	Digital Electronics and Logic Design	ES		3	0	0	0	0	30	45	3	75
T7555	0701240307	Digital Electronics and Logic Design Lab	ES		0	0	2	10	15	0	0	1	25
T7996	0701240308	Computer Organization	PC		3	0	0	0	0	30	45	3	75
F7010	0701240309	Agile Software Development	PC		3	0	0	0	0	75	0	3	75
TE7300	0701240310	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
TH4095	0701240311	Fitness for Life *			0	0	0	0	0	0	0	Non - Letter Grade	0
TH4272	0701240312	Certificate in COVID-19 Care for the Community *	0		0	0	0	0	0	0	0	Non - Letter Grade	0
				Total	**18**	**1**	**10**	**80**	**45**	**235**	**240**	**24**	**600**
Semester : 4													
Generic Core Courses													
TE7170	0701240401	Engineering Mathematics-III	BS		2	1	0	0	0	30	45	3	75
F7034	0701240402	Java	PC		4	0	0	0	0	100	0	4	100
T7488	0701240403	Data Structures	PC		3	0	0	0	0	30	45	3	75
T7489	0701240404	Data Structures Lab	PC		0	0	2	10	15	0	0	1	25
T7510	0701240405	Operating Systems	PC		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7511	0701240406	Operating Systems Lab	PC		0	0	2	10	15	0	0	1	25
TE7290	0701240407	Project Based Learning -I	PIS		0	0	4	50	0	0	0	2	50
T4005	0701240408	Integrated Disaster Management *			0	0	0	0	0	0	0	Non - Letter Grade	0
				Total	**12**	**1**	**8**	**70**	**30**	**190**	**135**	**17**	**425**
Generic Elective Courses Group													
T6184	0701240409	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6186	0701240410	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6188	0701240411	Basic Spanish I	GE		2	0	0	0	0	50	0	2	50
				Total Required Credits				**0**	**0**	**50**	**0**	**2**	**50**
Semester : 5													
Generic Core Courses													
T8000	0701240501	Service Learning	HS		0	0	8	100	0	0	0	4	100
F7046	0701240502	Introduction to Full Stack Development	PC		4	0	0	0	0	100	0	4	100
T7908	0701240503	Computer Networks	PC		3	0	0	0	0	30	45	3	75
T7482	0701240504	Computer Networks Lab	PC		0	0	2	10	15	0	0	1	25
T7907	0701240505	Database Management Systems	PC		3	0	0	0	0	30	45	3	75
T7487	0701240506	Data Base Management Systems Lab	PC		0	0	4	20	30	0	0	2	50

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7299	0701240507	Theory of Computation	PC		3	0	0	0	0	30	45	3	75
T6774	0701240508	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
				Total	**15**	**0**	**14**	**130**	**45**	**240**	**135**	**22**	**550**
Open Elective Course Group													
T7393	0701240509	Computer Based Statistical Packages	OE		3	0	0	0	0	30	45	3	75
T7499	0701240510	Java	OE		3	0	0	0	0	30	45	3	75
T7574	0701240511	MATLAB	OE		3	0	0	0	0	30	45	3	75
TE7698	0701240512	Nanotechnology	OE		3	0	0	0	0	30	45	3	75
TE7387	0701240513	Project Management	OE		3	0	0	0	0	30	45	3	75
TE7223	0701240514	Smart Urban Planning	OE		3	0	0	0	0	30	45	3	75
TE7240	0701240515	Water Resource Planning and Management	OE		3	0	0	0	0	30	45	3	75
TE7263	0701240516	Introduction to AI and Machine Learning	OE		3	0	0	0	0	30	45	3	75
TE7265	0701240517	Introduction to Data Science	OE		3	0	0	0	0	30	45	3	75
TE7428	0701240518	Introduction to Image Processing	OE		3	0	0	0	0	30	45	3	75
TE7335	0701240519	Introduction to Robotics	OE		3	0	0	0	0	30	45	3	75
TE7339	0701240520	Renewable Energy Systems	OE		3	0	0	0	0	30	45	3	75
TE7351	0701240521	3D Printing and Prototyping	OE		3	0	0	0	0	30	45	3	75
TE7365	0701240522	Electrical and Electronics Materials	OE		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7388	0701240523	Quality Management Techniques	OE		3	0	0	0	0	30	45	3	75
Total Required Credits					**0**	**0**		**30**	**45**	**3**	**75**		
Semester : 6													
Generic Core Courses													
TE7008	0701240601	Distributed Systems and Resource Management	PC		3	0	0	0	0	30	45	3	75
F7053	0701240602	Web and Mobile Application Development	PC		3	0	0	0	0	75	0	3	75
T6749	0701240603	Design Thinking	HS		2	0	0	0	0	50	0	2	50
TE7291	0701240604	Project Based Learning-II	PIS		0	0	4	50	0	0	0	2	50
T7802	0701240605	Capstone Course	PC		2	0	0	0	0	50	0	2	50
Total					**10**	**0**	**4**	**50**	**0**	**205**	**45**	**12**	**300**
Generic Elective Courses Group - I													
TE7438	0701240606	History of Science and Technology	GE		2	0	0	0	0	50	0	2	50
T2585	0701240653	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50
Total Required Credits								**0**	**0**	**50**	**0**	**2**	**50**
Generic Elective Courses Group - II													
TE7101	0701240607	Internet of Things	PE		3	0	0	0	0	30	45	3	75
TE7255	0701240608	Data Warehousing and Mining	PE		3	0	0	0	0	30	45	3	75
TE7328	0701240609	Image Processing	PE		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - III													
TE7329	0701240610	Image Processing Lab	PE		0	0	2	10	15	0	0	1	25
T7528	0701240611	Internet of Things Lab	PE		0	0	2	10	15	0	0	1	25
TE7013	0701240612	Data Warehousing and Mining Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**0**	**0**	**1**	**25**
Generic Elective Courses Group - IV													
T7473	0701240613	Artificial Intelligence	PE		3	0	0	0	0	30	45	3	75
TE7259	0701240614	Human Computer Interface	PE		3	0	0	0	0	30	45	3	75
TE7243	0701240615	Advanced Algorithms	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - V													
TE7244	0701240616	Advanced Algorithms Lab	PE		0	0	2	10	15	0	0	1	25
TE7260	0701240617	Human Computer Interface Lab	PE		0	0	2	10	15	0	0	1	25
TE7014	0701240618	Artificial Intelligence Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**0**	**0**	**1**	**25**
Open Elective Course Group													
T7474	0701240619	Basics of Database	OE		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7616	0701240620	Fundamentals of Automotive Technology	OE		3	0	0	0	0	30	45	3	75
T7529	0701240621	Machine Learning	OE		3	0	0	0	0	30	45	3	75
TE7756	0701240622	Open Source Technologies	OE		3	0	0	0	0	30	45	3	75
T7584	0701240623	Printed Circuit Board (PCB) Design	OE		3	0	0	0	0	30	45	3	75
T7650	0701240624	Six sigma	OE		3	0	0	0	0	30	45	3	75
TE7700	0701240625	Smart Materials	OE		3	0	0	0	0	30	45	3	75
TE7264	0701240626	Introduction to BIGDATA	OE		3	0	0	0	0	30	45	3	75
TE7171	0701240627	Introduction to Mathematical Modelling	OE		3	0	0	0	0	30	45	3	75
TE7195	0701240628	GIS Applications	OE		3	0	0	0	0	30	45	3	75
TE7203	0701240629	Intelligent Transportation Management	OE		3	0	0	0	0	30	45	3	75
TE7334	0701240630	Introduction to Mechatronics	OE		3	0	0	0	0	30	45	3	75
TE7338	0701240631	Principles of Modern Communication Systems	OE		3	0	0	0	0	30	45	3	75
TE7376	0701240632	Introduction to Operations Research	OE		3	0	0	0	0	30	45	3	75
TE7377	0701240633	Introduction to Optimisation	OE		3	0	0	0	0	30	45	3	75
				Total Required Credits				**0**	**0**	**30**	**45**	**3**	**75**
				GIP									
G7002	0701240654	Global Immersion Programme			0	0	0	0	0	0	50	2	50

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Note: For students under Global Immersion Programme (0701240654), course "Capstone Course" (0701240606) will be waived off.													
Semester : 7													
Generic Core Courses													
T7804	0701240701	B.Tech Project	PIS		0	0	8	40	60	0	0	4	100
TE7294	0701240702	Search Engine Optimization	PC		4	0	0	0	0	40	60	4	100
F7044	0701240703	Big Data, Hadoop & Apache Spark	PC		3	0	0	0	0	75	0	3	75
T7674	0701240704	Cyber Security	PC		2	0	0	0	0	50	0	2	50
				Total	**9**	**0**	**8**	**40**	**60**	**165**	**60**	**13**	**325**
Generic Elective Courses Group - I													
TE7253	0701240705	Data Science	PE		3	0	0	0	0	30	45	3	75
TE7282	0701240706	Optimization Techniques and Algorithms	PE		3	0	0	0	0	30	45	3	75
TE7097	0701240707	Neural Network	PE		3	0	0	0	0	30	45	3	75
				Total Required Credits				**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - II													
TE7112	0701240708	Neural Networks Lab	PE		0	0	2	10	15	0	0	1	25
TE7283	0701240709	Optimization Techniques and Algorithms Lab	PE		0	0	2	10	15	0	0	1	25
TE7254	0701240710	Data Science Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits				**10**	**15**	**0**	**0**	**1**	**25**

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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	Lab	CA	ESE	CA	ESE		
Generic Elective Courses Group - III													
T7529	0701240711	Machine Learning	PE		3	0	0	0	0	30	45	3	75
T7138	0701240712	Network Security	PE		3	0	0	0	0	30	45	3	75
TE7103	0701240713	Natural Language Processing	PE		3	0	0	0	0	30	45	3	75
				Total Required Credits				**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - IV													
TE7105	0701240714	Machine Learning Lab	PE		0	0	2	10	15	0	0	1	25
TE7106	0701240715	Natural Language Processing Lab	PE		0	0	2	10	15	0	0	1	25
T7506	0701240716	Network Security 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													
TE7251	0701240717	Computer Graphics	PE		3	0	0	0	0	30	45	3	75
TE7297	0701240718	Software Testing Tools	PE		3	0	0	0	0	30	45	3	75
TE7916	0701240719	Cloud Computing Tools and Techniques	PE		3	0	0	0	0	30	45	3	75
				Total Required Credits				**0**	**0**	**30**	**45**	**3**	**75**
Semester : 8													
Generic Core Courses													
T7912	0701240801	Internship	PIS		0	0	24	120	180	0	0	12	300
T7802	0701240802	Seminar	PIS		0	0	4	50	0	0	0	2	50

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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	Lab	CA	ESE	CA	ESE		
				Total	0	0	28	170	180	0	0	14	350

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

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Semester	Internal Credits	External Credits	Total Credits	Total Marks
Semester 1	1	17	18	450
Semester 2	4	17	21	525
Semester 3	5	19	24	600
Semester 4	8	11	19	475
Semester 5	10	15	25	625
Semester 6	11	14	25	625
Semester 7	5	19	24	600
Semester 8	2	12	14	350
Total	**46**	**124**	**170**	**4250**

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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	Lab	CA	ESE	CA	ESE		
Semester : 5													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TE7273	0701240524	Machine Learning: Classification	PC		3	0	0	0	0	30	45	3	75
TE7274	0701240525	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													
Computing Specialization Core Courses													
TE7248	0701240526	Cloud Computing	PC		3	0	0	0	0	30	45	3	75
TE7250	0701240527	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													
Data Science Specialization Core Courses													
TE7281	0701240528	Open Source Tools for Data Science	PC		4	0	0	0	0	40	60	4	100
TE7292	0701240529	R Programming	PC		3	0	0	0	0	30	45	3	75
		Total			**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**

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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	Lab	CA	ESE	CA	ESE		
Semester : 5													
Game Design and Development Specialization Core Courses													
TE7267	0701240530	Introduction to Game Development	PC		3	0	0	0	0	30	45	3	75
TE7285	0701240531	Principles of Game Design	PC		3	0	0	0	0	30	45	3	75
		Total			**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**
Semester : 5													
Internet of Things Specialization Core Courses													
TE7268	0701240532	Introduction to IOT	PC		4	0	0	0	0	40	60	4	100
TE7293	0701240533	Raspberry Pi and Python	PC		3	0	0	0	0	30	45	3	75
		Total			**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
Semester : 5													
Security and Privacy Specialization Core Courses													
TE7296	0701240534	Software Security	PC		3	0	0	0	0	30	45	3	75
TE7301	0701240535	Usable Security	PC		3	0	0	0	0	30	45	3	75
		Total			**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**

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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	Lab	CA	ESE	CA	ESE		
Semester : 6													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TE7266	0701240634	Introduction to Deep Learning	PE		4	0	0	0	0	40	60	4	100
TE7271	0701240635	Machine Learning Clustering and Retrieval	PE		3	0	0	0	0	30	45	3	75
				Total	**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
Semester : 6													
Computing Specialization Core Courses													
TE7246	0701240636	Block Chain	PE		4	0	0	0	0	40	60	4	100
TE7249	0701240637	Cloud Computing Platforms	PE		3	0	0	0	0	30	45	3	75
				Total	**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
Semester : 6													
Data Science Specialization Core Courses													
TE7284	0701240639	Power BI	PE		3	0	0	0	0	30	45	3	75
TE7247	0701240638	Business Analytics	PE		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**

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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	Lab	CA	ESE	CA	ESE		
Semester : 6													
Game Design and Development Specialization Core Courses													
TE7275	0701240640	Modern Platforms in Game Development	PE		4	0	0	0	0	40	60	4	100
TE7256	0701240641	Enterpreneurship in Game Development	PE		3	0	0	0	0	30	45	3	75
		Total			**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
Semester : 6													
Internet of Things Specialization Core Courses													
TE7295	0701240642	Software Defined Networking	PE		3	0	0	0	0	30	45	3	75
TE7269	0701240643	IOT Security and Privacy	PE		3	0	0	0	0	30	45	3	75
		Total			**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**
Semester : 6													
Security and Privacy Specialization Core Courses													
TE7252	0701240644	Cryptography	PE		4	0	0	0	0	40	60	4	100
TE7258	0701240645	Hardware Security	PE		3	0	0	0	0	30	45	3	75
		Total			**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**

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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	Lab	CA	ESE	CA	ESE		
Semester : 7													
Artificial Intelligence and Machine Learning Specialization Core Courses													
T7805	0701240720	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701240721	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													
Computing Specialization Core Courses													
T7805	0701240720	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701240721	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													
T7805	0701240720	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701240721	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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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	Lab	CA	ESE	CA	ESE		
Semester : 7													
Game Design and Development Specialization Core Courses													
T7805	0701240720	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701240721	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	0701240720	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701240721	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
		Total			**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													
Security and Privacy Specialization Core Courses													
T7805	0701240720	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701240721	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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Optional 'Honours' Specialization

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**

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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	Lab	CA	ESE	CA	ESE		
Semester : 5													
Automobile Engineering with Hybrid and Autonomous Technology Specialization Core Courses													
TE7355	0701240536	Basics of Automotive Engineering	PC		3	0	0	0	0	30	45	3	75
TE7666	0701240538	Automotive Vehicle Dynamics and NVH Lab	PC		0	0	2	10	15	0	0	1	25
TE7665	0701240537	Automotive Electronics and Instrumentation	PC		2	0	0	0	0	50	0	2	50
				Total	**5**	**0**	**2**	**10**	**15**	**80**	**45**	**6**	**150**
Semester : 5													
Embedded Systems Specialization Core Courses													
T7801	0701240539	Specialization Project	PIS		0	0	2	10	15	0	0	1	25
T7802	0701240540	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
TE7298	0701240541	System Programming	PC		4	0	0	0	0	40	60	4	100
				Total	**4**	**0**	**6**	**30**	**45**	**40**	**60**	**7**	**175**
Semester : 5													
Smart Cities and Urban Analytics Specialization Core Courses													
TE7220	0701240542	Smart Cities : Context Policy and Governance	PC		3	0	0	0	0	30	45	3	75
TE7206	0701240543	IOT for Smart Cities	PC		3	0	0	0	0	30	45	3	75

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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	Lab	CA	ESE	CA	ESE		
TE7207	0701240544	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 : 6													
Automobile Engineering with Hybrid and Autonomous Technology Specialization Core Courses													
TE7669	0701240646	Hybrid Technology	PC		2	0	0	0	0	20	30	2	50
F7036	0701240647	Autonomous Technology (Self Driven Cars)	PC		2	0	0	0	0	50	0	2	50
TE7435	0701240648	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													
Embedded Systems Specialization Core Courses													
TE7325	0701240649	Embedded Linux	PC		4	0	0	0	0	40	60	4	100
T7802	0701240650	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
				Total	**4**	**0**	**4**	**20**	**30**	**40**	**60**	**6**	**150**
Semester : 6													
Smart Cities and Urban Analytics Specialization Core Courses													

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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	Lab	CA	ESE	CA	ESE		
T7802	0701240651	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50
TE7177	0701240652	Application of Sensor Technology to Smart Cities	PE		3	0	0	0	0	30	45	3	75
T7802	0701240650	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
				Total	**3**	**0**	**8**	**100**	**0**	**30**	**45**	**7**	**175**
Semester : 7													
Automobile Engineering with Hybrid and Autonomous Technology Specialization Core Courses													
T7805	0701240722	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701240723	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													
Embedded Systems Specialization Core Courses													
T7802	0701240724	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7304	0701240725	Advanced Microcontrollers and RTOS	PC		4	0	0	0	0	40	60	4	100
TE7305	0701240726	Advanced Microcontrollers and RTOS Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**4**	**0**	**6**	**30**	**45**	**40**	**60**	**7**	**175**

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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	Lab	CA	ESE	CA	ESE		
Semester : 7													
Smart Cities and Urban Analytics Specialization Core Courses													
T7803	0701240727	Specialization Project	PIS		0	0	6	30	45	0	0	3	75
		Total			**0**	**0**	**6**	**30**	**45**	**0**	**0**	**3**	**75**
Specialization Elective : Smart Cities and Urban Analytics													
TE7205	0701240728	Intelligent Transportation Systems	PE		3	0	0	0	0	30	45	3	75
TE7234	0701240729	Urban Hydrology and Hydraulics	PE		3	0	0	0	0	30	45	3	75
		Total Required Credits						**0**	**0**	**30**	**45**	**3**	**75**

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Semester	Internal Credits	External Credits	Total Credits	Total Marks
Automobile Engineering with Hybrid and Autonomous Technology				
Semester 5	2	4	6	150
Semester 6	2	5	7	175
Semester 7	0	7	7	175
Total	**4**	**16**	**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**
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**