Symbiosis Institute of Technology, Pune
Bachelor of Technology (Computer Science and Engineering)
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<table>
<tr><td>1.</td><td>OBJECTIVE</td><td colspan="4">B. Tech (Computer Science and Engineering) is a full-time four year graduation programme, which aims at transforming a student into a technically sound professional. The syllabus contains courses on basic sciences, technical arts, humanities & liberal arts and professional courses. The mix of these courses has been evolved with an aim to produce professionals who have knowledge not only of Engineering but who are good managers to contribute in a cross-functional team and have human values.
Being a professional programme it ensures a healthy balance between theoretical foundation and practical exposure to the present day world.
The emphasis is to develop all round personality that would enable the students to take up the challenges of the corporate world and also become responsible citizens of the society.</td></tr>
<tr><td>2.</td><td>DURATION (IN MONTHS)</td><td colspan="4">48 (Full Time)</td></tr>
<tr><td>3.</td><td>INTAKE</td><td colspan="4">180</td></tr>
<tr><td rowspan="4">4.</td><td rowspan="4">RESERVATION</td><td rowspan="2">I.Within the sanctioned intake</td><td>a) SC
(In Percentage)</td><td>b) ST
(In Percentage)</td><td>c) Differently abled
(In Percentage)</td></tr>
<tr><td>15</td><td>7.5</td><td>3</td></tr>
<tr><td rowspan="2">II.Over and above the sanctioned intake</td><td colspan="2">a) Kashmiri Migrants
(In Seats)</td><td>b) International Students
(In Percentage)</td></tr>
<tr><td colspan="2">2</td><td>20</td></tr>
<tr><td>5.</td><td>ELIGIBILITY</td><td colspan="4">Passed 10+2 examination with Physics and Mathematics as compulsory subjects along with one of Chemistry/ Computer Science/Electronics/ Information Technology/Biology/Informatics Practices/ Biotechnology/Technical Vocational subject/ Agriculture/ Engineering Graphics/Business Studies /Entrepreneurship. 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,</td></tr>
</table>

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		Engineering drawing, etc., for 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 atleast 45% marks (40% marks or equivalent grade for Scheduled Caste / Scheduled Tribes) and passed 10+2 examination with Mathematics as a subject. OR Passed B. Voc/3-year D.Voc. Stream in the same allied sector. (The Constituent will offer suitable bridge courses such as Mathematics, Physics, Engineering drawing, etc., for the students coming from diverse backgrounds to achieve desired learning outcomes of the programme).
6.	**SELECTION PROCEDURE**	Merit list by valid score of Symbiosis Entrance Test (SITEEE) or Joint Entrance Examination (JEE - Main) or Any State Government Engineering Entrance Examination.
7.	**MEDIUM OF INSTRUCTION**	English
8.	**PROGRAMME PATTERN**	Semester
9.	**COURSE & SPECIALISATION**	Annexure A: Bachelor of Technology (Computer Science and 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. Annexure B: Optional 'Honours' specialization area 1. Artificial Intelligence and Machine Learning 2. Computing 3. Data Science 4. Game Design and Development

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		5. Security and Privacy 6. Internet of Things Annexure C: Optional 'Minor' specialization area 1. Automobile Engineering with Hybrid and Autonomous Technology 2. Computer Vision 3. Modern Computer Networking 4. Semiconductor Technology 5. Smart Cities and Urban Analytics			
10.	**FEE**		**Academic Fee p.a**	**Institute Deposit**	**Total**
	Indian Students (Amount in INR)		330000	20000	350000
	International Students	**NRI/ PIO/ OCI Category (Amount in US$)**	6300	275	6575
		Foreign National Category (Amount in US$)	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 (Computer Science and Engineering) OR Bachelor of Technology (Computer Science and Engineering) with Honours in Artificial Intelligence and Machine Learning / Computing / Data Science / Game Design and Development / Security and Privacy /Internet of Things. OR Bachelor of Technology (Computer Science and Engineering) with Minor in Automobile Engineering with Hybrid and Autonomous Technology/Computer Vision/ Modern Computer Networking/ Semiconductor Technology/Smart Cities and Urban Analytics 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	0	As per the student's choice	20
2	19	0	0	0	0	1 *		19
3	23	1	0	0	0	1 *		24
4	18	2	0	0	0	1 *		20
5	21	0	0	0	3	1 *		24
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**	**24**	**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 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 14/05/2025 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													
TE7680	0701220101	Mathematics-I	BS		2	1	0	0	0	30	45	3	75
TE7694	0701220102	Chemistry	BS		3	0	0	0	0	30	45	3	75
TE7695	0701220103	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
T7540	0701220104	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	0701220105	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
TE7286	0701220106	Programming and Problem Solving	ES		2	0	0	0	0	20	30	2	50
TE7287	0701220107	Programming and Problem Solving Lab	ES		0	0	2	10	15	0	0	1	25
T7925	0701220108	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
T6732	0701220109	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
TE7749	0701220110	Software Tools for Computer Science	ES		0	0	2	25	0	0	0	1	25
TE7300	0701220111	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
				Total	**11**	**1**	**16**	**125**	**75**	**135**	**165**	**20**	**500**
Semester : 2													
Generic Core Courses													
TE7681	0701220201	Mathematics II	BS		3	1	0	0	0	40	60	4	100
TE7684	0701220202	Physics for Computer Engineers	BS		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7687	0701220203	Physics Lab	BS		0	0	2	10	15	0	0	1	25
T7383	0701220204	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	0701220205	Communication skills lab	HS		0	0	2	10	15	0	0	1	25
TE7288	0701220206	Programming in C	PC		3	0	0	0	0	30	45	3	75
TE7289	0701220207	Programming in C Lab	PC		0	0	2	10	15	0	0	1	25
T6873	0701220208	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
TE7689	0701220209	Statistics and Probability	BS		2	1	0	0	0	30	45	3	75
TE7188	0701220210	Environmental Science *			0	0	0	0	0	0	0	0	0
				Total	**14**	**2**	**6**	**30**	**45**	**175**	**225**	**19**	**475**
Semester : 3													
Generic Core Courses													
TE7675	0701220301	Discrete Mathematics and Graph Theory	BS		3	1	0	0	0	40	60	4	100
T7996	0701220302	Computer Organization	PC		3	0	0	0	0	30	45	3	75
TE7960	0701220303	Data Structures	PC		3	0	0	0	0	30	45	3	75
TE7959	0701220304	Data Structures Lab	PC		0	0	2	10	15	0	0	1	25
T7512	0701220305	Programming Paradigms	PC		3	0	0	0	0	30	45	3	75
T7513	0701220306	Programming Paradigms Lab	PC		0	0	2	10	15	0	0	1	25
TE7745	0701220307	Sensors and Microcontrollers	ES		3	0	0	0	0	30	45	3	75
TE7746	0701220308	Sensors and Microcontrollers Lab	ES		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T2646	0701220309	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
F7084	0701220310	Full Stack Development	PC		3	0	0	0	0	75	0	3	75
TH4788	0701220311	Health and Wellness Module I *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**19**	**1**	**6**	**30**	**45**	**260**	**240**	**23**	**575**
Generic Elective Courses Group													
T6872	0701220312	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25
T6760	0701220313	Introduction to Indian Philosophy	GE		1	0	0	0	0	25	0	1	25
				Total Required Credits				**0**	**0**	**25**	**0**	**1**	**25**
Semester : 4													
Generic Core Courses													
TEE7108	0701220401	Mathematics - III	BS		2	1	0	0	0	30	45	3	75
F7054	0701220402	Object Oriented Programming with Java	PC		4	0	0	0	0	100	0	4	100
T7907	0701220403	Database Management Systems	PC		3	0	0	0	0	30	45	3	75
T7487	0701220404	Data Base Management Systems Lab	PC		0	0	4	20	30	0	0	2	50
T7510	0701220405	Operating Systems	PC		3	0	0	0	0	30	45	3	75
T7511	0701220406	Operating Systems Lab	PC		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7290	0701220407	Project Based Learning -I	PIS		0	0	4	50	0	0	0	2	50
TH4789	0701220408	Health and Wellness Module II *			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**12**	**1**	**10**	**80**	**45**	**190**	**135**	**18**	**450**
Generic Elective Courses Group													
T6184	0701220409	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6186	0701220410	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6188	0701220411	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													
F0004	0701220501	Flexi-Credit Course	PC		4	0	0	0	0	100	0	4	100
T8000	0701220502	Service Learning	HS		0	0	8	100	0	0	0	4	100
T7908	0701220503	Computer Networks	PC		3	0	0	0	0	30	45	3	75
T7482	0701220504	Computer Networks Lab	PC		0	0	2	10	15	0	0	1	25
T7909	0701220505	Design and Analysis of Algorithms	PC		3	0	0	0	0	30	45	3	75
T7491	0701220506	Design and Analysis of Algorithms Lab	PC		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7299	0701220507	Theory of Computation	PC		3	0	0	0	0	30	45	3	75
T6774	0701220508	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
SMC001	0701220546	*Vasudhaiva Kutumbakam **			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**15**	**0**	**12**	**120**	**30**	**240**	**135**	**21**	**525**
Open Elective Courses Group													
TE7677	0701220509	Financial Mathematics	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7700	0701220510	Smart Materials	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7223	0701220511	Smart Urban Planning	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7240	0701220512	Water Resource Planning and Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7948	0701220513	Introduction to Cloud Computing	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7952	0701220514	User Interface and Experience Design	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TEE7018	0701220515	Engineering Simulation and Modeling Tools	OE	Electronics and Telecommunication Engineering	3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7428	0701220516	Introduction to Image Processing	OE	Electronics and Telecommunication Engineering	3	0	0	0	0	30	45	3	75
TE7810	0701220517	Industrial Revolution and Introduction of Industry 5.0	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
T7650	0701220518	Six Sigma	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 6													
Generic Core Courses													
TE7008	0701220601	Distributed Systems and Resource Management	PC		3	0	0	0	0	30	45	3	75
F0003	0701220602	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
T6749	0701220603	Design Thinking	HS		2	0	0	0	0	50	0	2	50
TE7291	0701220604	Project Based Learning-II	PIS		0	0	4	50	0	0	0	2	50
T7802	0701220605	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 (Choose any one group A to C) **Generic Elective Courses Group - A**													
TE7255	0701220606	Data Warehousing and Mining	PE		3	0	0	0	0	30	45	3	75
TEE7099	0701220607	Data Warehousing and Mining Lab	PE		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - B													
TE7101	0701220608	Internet of Things	PE		3	0	0	0	0	30	45	3	75
TE7262	0701220609	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													
TE7916	0701220610	Cloud Computing Tools and Techniques	PE		3	0	0	0	0	30	45	3	75
TE7949	0701220611	Cloud Computing Tools and Techniques Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group-II (Choose any one group D to F) Generic Elective Courses Group - D													
T7473	0701220612	Artificial Intelligence	PE		3	0	0	0	0	30	45	3	75
TE7014	0701220613	Artificial Intelligence 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													
TE7328	0701220614	Image Processing	PE		3	0	0	0	0	30	45	3	75
TE7329	0701220615	Image Processing Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**

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Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Generic Elective Courses Group - F													
TE7953	0701220616	Information and Network Security	PE		3	0	0	0	0	30	45	3	75
TE7947	0701220617	Information and Network Security Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits				**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - III													
T2585	0701220618	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50
TE7438	0701220619	History of Science and Technology	GE		2	0	0	0	0	50	0	2	50
				Total Required Credits				**0**	**0**	**50**	**0**	**2**	**50**
Open Elective Courses Group													
TE7698	0701220620	Nanotechnology	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7676	0701220621	Executive Corporate Communication For Impact	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7195	0701220622	GIS Applications	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7203	0701220623	Intelligent Transportation Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7297	0701220624	Software Testing Tools	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7756	0701220625	Open Source Technologies	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7584	0701220626	Printed Circuit Board (PCB) Design	OE	Electronics and Telecommunication Engineering	3	0	0	0	0	30	45	3	75
TE7334	0701220627	Introduction to Mechatronics	OE	Electronics and Telecommunication Engineering	3	0	0	0	0	30	45	3	75
TEE7044	0701220628	Data Modelling and Analytics for Battery Energy Storage Systems	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7351	0701220629	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**
Semester : 7													
Generic Core Courses													
T7804	0701220701	B.Tech Project	PIS		0	0	8	40	60	0	0	4	100
TE7751	0701220702	Compiler Construction	PC		3	0	0	0	0	30	45	3	75
T7478	0701220703	Compiler Construction Lab	PC		0	0	2	10	15	0	0	1	25
F0003	0701220704	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
TEE7098	0701220705	Cyber Security	PC		2	0	0	0	0	20	30	2	50
Total					**8**	**0**	**10**	**50**	**75**	**125**	**75**	**13**	**325**
Generic Elective Courses Group -I (Choose Any One Group A to C) **Generic Elective Courses Group - A**													

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7253	0701220706	Data Science	PE		3	0	0	0	0	30	45	3	75
TE7254	0701220707	Data Science Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits				**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - B													
TE7282	0701220708	Optimization Techniques and Algorithms	PE		3	0	0	0	0	30	45	3	75
TE7283	0701220709	Optimization Techniques and Algorithms 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													
TE7552	0701220710	Big Data Analytics	PE		3	0	0	0	0	30	45	3	75
TE7554	0701220711	Big Data Analytics Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits				**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group -II													
TE7955	0701220712	Introduction to AR/VR	PE		3	0	0	0	0	30	45	3	75
TE7259	0701220713	Human Computer Interface	PE		3	0	0	0	0	30	45	3	75
TE7954	0701220714	Introduction to Information Retrieval	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 Group D to F) Generic Elective Courses Group - D													
T7529	0701220715	Machine Learning	PE		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		
TE7105	0701220716	Machine Learning 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													
TEE7101	0701220717	Natural Language Processing	PE		3	0	0	0	0	30	45	3	75
TEE7100	0701220718	Natural Language Processing Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group - F													
TE7951	0701220719	DevOps	PE		2	0	0	0	0	20	30	2	50
TE7950	0701220720	DevOps Lab	PE		0	0	4	20	30	0	0	2	50
Total Required Credits								**20**	**30**	**20**	**30**	**4**	**100**
Semester : 8													
Generic Core Courses													
T7912	0701220801	Internship	PIS		0	0	24	120	180	0	0	12	300
T7802	0701220802	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	4	16	20	500
Semester 2	1	18	19	475
Semester 3	5	19	24	600
Semester 4	8	12	20	500
Semester 5	10	14	24	600
Semester 6	11	14	25	625
Semester 7	3	21	24	600
Semester 8	0	14	14	350
Total	**42**	**128**	**170**	**4250**

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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 : 5													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
TE7273	0701220519	Machine Learning: Classification	PC		3	0	0	0	0	30	45	3	75
TE7274	0701220520	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 Specialisation Core Courses													
TE7248	0701220521	Cloud Computing	PC		3	0	0	0	0	30	45	3	75
TE7250	0701220522	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 Specialisation Core Courses													
TE7281	0701220523	Open Source Tools for Data Science	PC		4	0	0	0	0	40	60	4	100
TE7292	0701220524	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' 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													
Game Design and Development Specialisation Core Courses													
TE7267	0701220525	Introduction to Game Development	PC		3	0	0	0	0	30	45	3	75
TE7285	0701220526	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													
Security and Privacy Specialisation Core Courses													
TE7296	0701220527	Software Security	PC		3	0	0	0	0	30	45	3	75
TE7301	0701220528	Usable Security	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 Specialisation Core Courses													
TE7268	0701220529	Introduction to IOT	PC		4	0	0	0	0	40	60	4	100
TE7293	0701220530	Raspberry Pi and Python	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													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
TE7266	0701220630	Introduction to Deep Learning	PC	Artificial Intelligence and Machine Learning	4	0	0	0	0	40	60	4	100
TE7271	0701220631	Machine Learning Clustering and Retrieval	PC	Artificial Intelligence and Machine Learning	3	0	0	0	0	30	45	3	75
				Total	**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
Semester : 6													
Computing Specialisation Core Courses													
TE7246	0701220632	Block Chain	PC	Computing	4	0	0	0	0	40	60	4	100
TE7249	0701220633	Cloud Computing Platforms	PC	Computing	3	0	0	0	0	30	45	3	75
				Total	**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
Semester : 6													
Data Science Specialisation Core Courses													
TE7247	0701220634	Business Analytics	PC	Data Science	3	0	0	0	0	30	45	3	75
TE7284	0701220635	Power BI	PC	Data Science	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		
				Total	**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**
				Semester : 6									
				Game Design and Development Specialisation Core Courses									
TE7275	0701220636	Modern Platforms in Game Development	PC	Game Design and Development	4	0	0	0	0	40	60	4	100
TE7256	0701220637	Enterpreneurship in Game Development	PC	Game Design and Development	3	0	0	0	0	30	45	3	75
				Total	**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
				Semester : 6									
				Security and Privacy Specialisation Core Courses									
TE7252	0701220638	Cryptography	PC	Security and Privacy	4	0	0	0	0	40	60	4	100
TE7258	0701220639	Hardware Security	PC	Security and Privacy	3	0	0	0	0	30	45	3	75
				Total	**7**	**0**	**0**	**0**	**0**	**70**	**105**	**7**	**175**
				Semester : 6									
				Internet of Things Specialisation Core Courses									
TE7269	0701220640	IOT Security and Privacy	PC	Internet of Things	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		
TE7295	0701220641	Software Defined Networking	PC	Internet of Things	3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**0**	**0**	**0**	**60**	**90**	**6**	**150**
Semester : 7													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
T7805	0701220721	Specialization Project	PIS	Artificial Intelligence and Machine Learning	0	0	10	50	75	0	0	5	125
T7802	0701220722	Specialization Seminar	PIS	Artificial Intelligence and Machine Learning	0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													
Computing Specialisation Core Courses													
T7805	0701220721	Specialization Project	PIS	Computing	0	0	10	50	75	0	0	5	125
T7802	0701220722	Specialization Seminar	PIS	Computing	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													

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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		
T7805	0701220721	Specialization Project	PIS	Data Science	0	0	10	50	75	0	0	5	125
T7802	0701220722	Specialization Seminar	PIS	Data Science	0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													
Game Design and Development Specialisation Core Courses													
T7805	0701220721	Specialization Project	PIS	Game Design and Development	0	0	10	50	75	0	0	5	125
T7802	0701220722	Specialization Seminar	PIS	Game Design and Development	0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**
Semester : 7													
Security and Privacy Specialisation Core Courses													
T7805	0701220721	Specialization Project	PIS	Security and Privacy	0	0	10	50	75	0	0	5	125
T7802	0701220722	Specialization Seminar	PIS	Security and Privacy	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		
Internet of Things Specialisation Core Courses													
T7805	0701220721	Specialization Project	PIS	Internet of Things	0	0	10	50	75	0	0	5	125
T7802	0701220722	Specialization Seminar	PIS	Internet of Things	0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**7**	**175**

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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**
Computing				
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**
Game Design and Development				
Semester 5	0	6	6	150
Semester 6	0	7	7	175
Semester 7	0	7	7	175
Total	**0**	**20**	**20**	**500**
Security and Privacy				
Semester 5	0	6	6	150
Semester 6	0	7	7	175

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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' Specialisation

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 5													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
TE7355	0701220531	Basics of Automotive Engineering	PE		3	0	0	0	0	30	45	3	75
TE7665	0701220532	Automotive Electronics and Instrumentation	PE		2	0	0	0	0	50	0	2	50
TE7666	0701220533	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 : 5													
Computer Vision Specialisation Core Courses													
TE7328	0701220534	Image Processing	PC		3	0	0	0	0	30	45	3	75
TE7329	0701220535	Image Processing Lab	PC		0	0	2	10	15	0	0	1	25
T3560	0701220536	Computer Vision	PC		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 5													
Modern Computer Networking Specialisation Core Courses													
TEE7062	0701220537	5G/6G Network Fundamentals	PC		3	0	0	0	0	30	45	3	75
TEE7061	0701220538	5G/6G Network Fundamentals Lab	PC		0	0	2	10	15	0	0	1	25

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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		
TE7295	0701220539	Software Defined Networking	0		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 5													
Semiconductor Technology Specialisation Core Courses													
TEE7057	0701220540	Introduction to Microfabrication	PC		3	0	0	0	0	30	45	3	75
TEE7056	0701220541	Introduction to Microfabrication Lab	PC		0	0	2	10	15	0	0	1	25
TEE7058	0701220542	Semiconductor Equipment Design and Technology	PC		3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 5													
Smart Cities and Urban Analytics Specialisation Core Courses													
TE7220	0701220543	Smart Cities : Context Policy and Governance	PC		3	0	0	0	0	30	45	3	75
TE7206	0701220544	IOT for Smart Cities	PC		3	0	0	0	0	30	45	3	75
TE7207	0701220545	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													

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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		
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
F0002	0701220643	Flexi-Credit Course	PE	Automobile Engineering with Hybrid and Autonomous Technology	2	0	0	0	0	50	0	2	50
TE7435	0701220644	Automotive Engine and Transmission System	PE	Automobile Engineering with Hybrid and Autonomous Technology	3	0	0	0	0	30	45	3	75
TE7669	0701220642	Hybrid Technology	PE	Automobile Engineering with Hybrid and Autonomous Technology	2	0	0	0	0	20	30	2	50
				Total	**7**	**0**	**0**	**0**	**0**	**100**	**75**	**7**	**175**
Semester : 6													
Computer Vision Specialisation Core Courses													
TEE7065	0701220645	Artificial Intelligence/Machine Learning based Computer Vision Techniques	PC	Computer Vision	3	0	0	0	0	30	45	3	75
TEE7063	0701220646	Artificial Intelligence/Machine Learning based Computer Vision Techniques Lab	PC	Computer Vision	0	0	2	10	15	0	0	1	25
TEE7064	0701220647	Object Detection and Tracking	PC	Computer Vision	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		
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 6													
Modern Computer Networking Specialisation Core Courses													
TEE7053	0701220648	Advanced Computer Networking Protocols	PC	Modern Computer Networking	3	0	0	0	0	30	45	3	75
TEE7052	0701220649	Advanced Computer Networking Protocols Lab	PC	Modern Computer Networking	0	0	2	10	15	0	0	1	25
TEE7039	0701220650	Cryptography and Network Security	PC	Modern Computer Networking	3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**7**	**175**
Semester : 6													
Semiconductor Technology Specialisation Core Courses													
TEE7060	0701220651	Application-Specific Integrated Circuit Design and Fabrication	PC	Semiconductor Technology	3	0	0	0	0	30	45	3	75
TEE7059	0701220652	Application-Specific Integrated Circuit Design and Fabrication Lab	PC	Semiconductor Technology	0	0	2	10	15	0	0	1	25
TEE7049	0701220653	Semiconductor Materials Synthesis and Characterization	PC	Semiconductor Technology	3	0	0	0	0	30	45	3	75
				Total	**6**	**0**	**2**	**10**	**15**	**60**	**90**	**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													
Smart Cities and Urban Analytics Specialisation Core Courses													
T7802	0701220654	Specialization Project	PIS	Smart Cities and Urban Analytics	0	0	4	50	0	0	0	2	50
T7802	0701220655	Specialization Seminar	PIS	Smart Cities and Urban Analytics	0	0	4	50	0	0	0	2	50
TE7177	0701220656	Application of Sensor Technology to Smart Cities	PE	Smart Cities and Urban Analytics	3	0	0	0	0	30	45	3	75
				Total	**3**	**0**	**8**	**100**	**0**	**30**	**45**	**7**	**175**
Semester : 7													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
T7805	0701220721	Specialization Project	PIS	Automobile Engineering with Hybrid and Autonomous Technology	0	0	10	50	75	0	0	5	125
T7802	0701220722	Specialization Seminar	PIS	Automobile Engineering with Hybrid and Autonomous Technology	0	0	4	20	30	0	0	2	50
				Total	**0**	**0**	**14**	**70**	**105**	**0**	**0**	**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 : 7													
Computer Vision Specialisation Core Courses													
T7802	0701220723	Specialization Project	PIS	Computer Vision	0	0	4	20	30	0	0	2	50
T7804	0701220724	Specialization Seminar	PIS	Computer Vision	0	0	8	40	60	0	0	4	100
				Total	**0**	**0**	**12**	**60**	**90**	**0**	**0**	**6**	**150**
Semester : 7													
Modern Computer Networking Specialisation Core Courses													
T7802	0701220723	Specialization Project	PIS	Modern Computer Networking	0	0	4	20	30	0	0	2	50
T7804	0701220724	Specialization Seminar	PIS	Modern Computer Networking	0	0	8	40	60	0	0	4	100
				Total	**0**	**0**	**12**	**60**	**90**	**0**	**0**	**6**	**150**
Semester : 7													
Semiconductor Technology Specialisation Core Courses													
T7802	0701220723	Specialization Project	PIS	Semiconductor Technology	0	0	4	20	30	0	0	2	50
T7804	0701220724	Specialization Seminar	PIS	Semiconductor Technology	0	0	8	40	60	0	0	4	100
				Total	**0**	**0**	**12**	**60**	**90**	**0**	**0**	**6**	**150**

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Annexure C
Optional 'Minor' Specialisation

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 7													
Smart Cities and Urban Analytics Specialisation Core Courses													
T7803	0701220725	Specialization Project	PIS	Smart Cities and Urban Analytics	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)													
TE7234	0701220726	Urban Hydrology and Hydraulics	PE		3	0	0	0	0	30	45	3	75
TE7205	0701220727	Intelligent Transportation Systems	PE		3	0	0	0	0	30	45	3	75
				Total Required Credits				**0**	**0**	**30**	**45**	**3**	**75**

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Optional 'Minor' Specialisation

Semester	Continuous Assessment	Term End Examination	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**
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**
Modern Computer Networking				
Semester 5	0	7	7	175
Semester 6	0	7	7	175
Semester 7	0	6	6	150
Total	**0**	**20**	**20**	**500**
Semiconductor Technology				
Semester 5	0	7	7	175
Semester 6	0	7	7	175
Semester 7	0	6	6	150
Total	**0**	**20**	**20**	**500**
Smart Cities and Urban Analytics				
Semester 5	0	7	7	175
Semester 6	4	3	7	175

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Optional 'Minor' Specialisation

Semester 7	0	6	6	150
Total	**4**	**16**	**20**	**500**