SYMBIOSIS INSTITITE OF TECHNOLOGY, HYDERABAD
BACHELOR OF TECHNOLOGY (COMPUTER SCIENCE AND TECHNOLOGY)
PROGRAMME STRUCTURE (2024-28)

<table>
<tr><td>1</td><td>Objectives</td><td>B. Tech (Computer Science and Technology) 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>48 (Full Time)</td></tr>
<tr><td>3</td><td>Intake</td><td>30</td></tr>
<tr><td>4</td><td>Reservation</td><td>
<table>
<tr><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>a) Kashmiri Migrants (In Seats)</td><td colspan="2">b) International Students (In Percentage)</td></tr>
<tr><td>02</td><td colspan="2">20</td></tr>
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</td></tr>
<tr><td>5</td><td>Eligibility</td><td>Passed 10+2 examination with Physics and Mathematics as compulsory subjects along with one of Chemistry/ Computer Science/ Electronics/ Information Technology/ Informatics Practices/ Technical Vocational subject/ Engineering Graphics</td></tr>
</table>

<table>
<tr><td></td><td></td><td>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 Universities will offer suitable bridge courses such as Mathematics, Physics, Engineering drawing, etc., for the students coming from diverse backgrounds to prepare Level playing field and desired learning outcomes of the programme.</td></tr>
<tr><td>6</td><td>Selection Procedure</td><td>Merit list by valid score of Symbiosis Entrance Test (SITEEE) or Joint Entrance Examination (JEE - Main) or Any State Government Engineering Entrance Examination.</td></tr>
<tr><td>7</td><td>Medium of Instruction</td><td>English</td></tr>
<tr><td>8</td><td>Programme Pattern</td><td>Semester</td></tr>
<tr><td>9</td><td>Courses & Specialization</td><td>As per Annexure A</td></tr>
<tr><td>10</td><td>Fee</td><td>
<table>
<tr><th></th><th>Academic Fee p.a</th><th>Institute Deposit</th><th>Total</th></tr>
<tr><td>Indian Students</td><td>330000</td><td>20000</td><td>350000</td></tr>
<tr><td>International Students (USD equivalent to INR)</td><td>$6300</td><td>$275</td><td>$6575</td></tr>
</table>
</td></tr>
<tr><td>11</td><td>Assessment</td><td>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.</td></tr>
<tr><td>12</td><td>Standard of Passing</td><td>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.</td></tr>
<tr><td>13</td><td>Award of</td><td>Bachelor of Technology (Computer Science and Technology) will be awarded at the end of</td></tr>
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	Degree	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	Specialization Core	Specialization Elective	Open Elective	Non-Letter Grade Mandatory Course/	Non-Letter Grade Audit Course/s	Total
1	20	0	0	0	0	0	As per the student's choice	20
2	19	0	0	0	0	2		19
3	23	1	0	0	0	0		24
4	18	2	0	0	0	1		20
5	21	0	0	0	3	0		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**

* Satisfactory completion of the non-letter grade course 'Integrated Disaster Management', 'Fitness for Life', 'Environmental Science' is mandatory for the award of degree.

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PROGRAMME STRUCTURE (2024-28)

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													
TE7680	101	Mathematics-I	BS		2	1	0	0	0	30	45	3	75
TE7694	102	Chemistry	BS		3	0	0	0	0	30	45	3	75
TE7695	103	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
T7540	104	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	105	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
TE7286	106	Programming and Problem Solving	ES		2	0	0	0	0	20	30	2	50
TE7287	107	Programming and Problem Solving Lab	ES		0	0	2	10	15	0	0	1	25
T7925	108	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
T6732	109	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
TE7749	110	Software Tools for Computer Science	ES		0	0	2	25	0	0	0	1	25
TE7300	111	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	201	Mathematics II	BS		3	1	0	0	0	40	60	4	100

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		
TE7684	202	Physics for Computer Engineers	BS		3	0	0	0	0	30	45	3	75
TE7687	203	Physics Lab	BS		0	0	2	10	15	0	0	1	25
T7383	204	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	205	Communication skills lab	HS		0	0	2	10	15	0	0	1	25
TE7288	206	Programming in C	PC		3	0	0	0	0	30	45	3	75
TE7289	207	Programming in C Lab	PC		0	0	2	10	15	0	0	1	25
T6873	208	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
TE7689	209	Statistics and Probability	BS		2	1	0	0	0	30	45	3	75
TE7188	210	Environmental Science *			0	0	0	0	0	0	0	Non - Letter Grade	0
Total					**14**	**2**	**6**	**30**	**45**	**175**	**225**	**19**	**475**
Semester : 3													
Generic Core Courses													
TE7675	301	Discrete Mathematics and Graph Theory	BS		3	1	0	0	0	40	60	4	100
T7996	302	Computer Organization	PC		3	0	0	0	0	30	45	3	75
TE7960	303	Data Structures	PC		3	0	0	0	0	30	45	3	75
TE7959	304	Data Structures Lab	PC		0	0	2	10	15	0	0	1	25
T7512	305	Programming Paradigms	PC		3	0	0	0	0	30	45	3	75
T7513	306	Programming Paradigms Lab	PC		0	0	2	10	15	0	0	1	25
TE7745	307	Digital Circuit and Design	ES		3	0	0	0	0	30	45	3	75
TE7746	308	Digital Circuit and Design Lab	ES		0	0	2	10	15	0	0	1	25
T2646	309	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25

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		
F0003	310	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
Total					**19**	**1**	**6**	**30**	**45**	**260**	**240**	**23**	**575**
Generic Elective Courses Group													
T6872	311	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25
T6760	312	Introduction to Indian Philosophy	GE		1	0	0	0	0	25	0	1	25
Total Required Credits					**1**	**0**	**0**	**0**	**0**	**25**	**0**	**1**	**25**
Semester: 4													
Generic Core Courses													
TE7170	401	Engineering Mathematics-III	BS		2	1	0	0	0	30	45	3	75
F0004	402	Flexi-Credit Course	PC		4	0	0	0	0	100	0	4	100
T7907	403	Database Management Systems	PC		3	0	0	0	0	30	45	3	75
T7487	404	Data Base Management Systems Lab	PC		0	0	4	20	30	0	0	2	50
T7510	405	Operating Systems	PC		3	0	0	0	0	30	45	3	75
T7511	406	Operating Systems Lab	PC		0	0	2	10	15	0	0	1	25
TE7290	407	Project Based Learning -I	PIS		0	0	4	50	0	0	0	2	50
T4005	408	Integrated Disaster Management *			0	0	0	0	0	0	0	Non-Letter Grade	0
Total					**12**	**1**	**10**	**80**	**45**	**190**	**135**	**18**	**450**
Generic Elective Courses Group													
T6184	409	Basic German I	GE		2	0	0	0	0	50	0	2	50

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		
T6186	410	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6188	411	Basic Spanish I	GE		2	0	0	0	0	50	0	2	50
Total Required Credits					**2**	**0**	**0**	**0**	**0**	**50**	**0**	**2**	**50**
Semester: 5													
Generic Core Courses													
F0004	501	Flexi-Credit Course	PC		4	0	0	0	0	100	0	4	100
T8000	502	Service Learning	HS		0	0	8	100	0	0	0	4	100
T7908	503	Computer Networks	PC		3	0	0	0	0	30	45	3	75
T7482	504	Computer Networks Lab	PC		0	0	2	10	15	0	0	1	25
T7909	505	Design and Analysis of Algorithms	PC		3	0	0	0	0	30	45	3	75
T7491	506	Design and Analysis of Algorithms Lab	PC		0	0	2	10	15	0	0	1	25
TE7299	507	Theory of Computation	PC		3	0	0	0	0	30	45	3	75
T6774	508	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
Total					**15**	**0**	**12**	**120**	**30**	**240**	**135**	**21**	**525**
Open Elective Courses Group													
TE7677	509	Financial Mathematics	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7700	510	Smart Materials	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7223	511	Smart Urban Planning	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7240	512	Water Resource Planning and Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
T7499	513	Java	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
TE7952	514	User Interface and Experience Design	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
TEE701	515	Engineering Simulation and Modeling Tools	OE	Electronics & Tele-communication	3	0	0	0	0	30	45	3	75

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		
8				Engineering									
TE7428	516	Introduction to Image Processing	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7810	517	Industrial Revolution and Introduction ofIndustry 5.0	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
T7650	518	Six sigma	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7948	519	Introduction to Cloud Computing	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
				Total	**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester: 6													
Generic Core Courses													
TE7008	601	Entrepreneurship in Computer Science and Technology	PC		3	0	0	0	0	30	45	3	75
F0003	602	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
T6749	603	Design Thinking	HS		2	0	0	0	0	50	0	2	50
TE7291	604	Project Based Learning-II	PIS		0	0	4	50	0	0	0	2	50
T7802	605	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 from Group A to Group C)													
Generic Elective Courses Group – A													
TE7255	606	Data Warehousing and Mining	PE		3	0	0	0	0	30	45	3	75
TE7013	607	Data Warehousing and Mining Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**

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 – B													
TE7101	608	Internet of Things	PE		3	0	0	0	0	30	45	3	75
TE7262	609	Internet of Things Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits					**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group – C													
TE7916	610	Cloud Computing Tools and Techniques	PE		3	0	0	0	0	30	45	3	75
TE7949	611	Cloud Computing Tools and Techniques Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits					**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group-II (Choose any one group from Group D to Group E)													
Generic Elective Courses Group – D													
T7473	612	Artificial Intelligence	PE		3	0	0	0	0	30	45	3	75
TE7014	613	Artificial Intelligence Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits					**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group – E													
TE7328	614	Image Processing	PE		3	0	0	0	0	30	45	3	75
TE7329	615	Image Processing Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits					**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group – F													
TE7953	616	Information and Network Security	PE		3	0	0	0	0	30	45	3	75
TE7947	617	Information and Network Security Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits					**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group – III													
T2585	618	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50

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		
TE7438	619	History of Science and Technology	GE		2	0	0	0	0	50	0	2	50
Total Required Credits					**2**	**0**	**0**	**0**	**0**	**50**	**0**	**2**	**50**
Open Elective Courses Group													
TE7698	620	Nanotechnology	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7676	621	Executive Corporate Communication For Impact	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7195	622	GIS Applications	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7203	623	Intelligent Transportation Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7297	624	Software Testing Tools	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
TE7756	625	Open Source Technologies	OE	Computer Science and Technology	3	0	0	0	0	30	45	3	75
T7584	626	Printed Circuit Board (PCB) Design	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7334	627	Introduction to Mechatronics	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7804	628	Design Optimization Techniques	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7351	629	3D Printing and Prototyping	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
Total Required Credits					**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 7													
Generic Core Courses													
T7804	701	B.Tech Project	PIS		0	0	8	40	60	0	0	4	100
TE7751	702	Compiler Construction	PC		3	0	0	0	0	30	45	3	75

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		
T7478	703	Compiler Construction Lab	PC		0	0	2	10	15	0	0	1	25
F0003	704	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
T7674	705	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 from Group A to Group D)													
Generic Elective Courses Group – A													
TE7253	706	Data Science	PE		3	0	0	0	0	30	45	3	75
TE7254	707	Data Science Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group – B													
TE7253	708	Advanced Internet of Things	PE		3	0	0	0	0	30	45	3	75
TE7254	709	Advanced Internet of Things Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group – C													
TE7282	710	Optimization Techniques and Algorithms	PE		3	0	0	0	0	30	45	3	75
TE7283	711	Optimization Techniques and Algorithms Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group – D													
TE7552	712	Big Data Analytics	PE		3	0	0	0	0	30	45	3	75
TE7554	713	Big Data Analytics Lab	PE		0	0	2	10	15	0	0	1	25
				Total Required Credits	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Courses Group – II													
TE7955	714	Introduction to AR/VR	PE		3	0	0	0	0	30	45	3	75

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		
TE7259	715	Human Computer Interface	PE		3	0	0	0	0	30	45	3	75
TE7954	716	Introduction to Information Retrieval	PE		3	0	0	0	0	30	45	3	75
Total Required Credits					**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - III (Choose Any One Group - E to Group G)													
Generic Elective Course Group – E													
T7529	717	Machine Learning	PE		3	0	0	0	0	30	45	3	75
TE7105	718	Machine Learning Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits					**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Course Group – F													
TE7103	719	Natural Language Processing	PE		3	0	0	0	0	30	45	3	75
TE7106	720	Natural Language Processing Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits					**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Generic Elective Course Group - G													
TE7951	721	DevOps	PE		2	0	0	0	0	20	30	2	50
TE7950	722	DevOps Lab	PE		0	0	4	20	30	0	0	2	50
Total Required Credits					**2**	**0**	**4**	**20**	**30**	**20**	**30**	**4**	**100**
Semester: 8													
Generic Core Courses													
T7912	801	Internship	PIS		0	0	24	120	180	0	0	12	300
T7802	802	Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					**0**	**0**	**28**	**140**	**210**	**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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Summary

Semester	Internal Credits	External Credits	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**