

**National Education Policy (NEP) Compliant Curriculum Structure for
B. Tech (Computer Science and Engineering)
(With effect from Academic Year 2025-26)**



॥वसुधैव कुटुम्बकम्॥

**Department of Computer Science and Engineering
Symbiosis Institute of Technology, Hyderabad.
Constituent of Symbiosis International (Deemed University), Pune.**

Established under Section 3 of the UGC Act of 1956 vide notification number F-9-12/2001-U-3 of the Government of India)
Re-Accredited by NAAC with 'A++' Grade

**Survey Number 292, Off Bangalore Highway, Modallaguda (V), Nandigama (M), Rangareddy
Dist, Hyderabad, Telangana, India, Pin Code: 509217**

Symbiosis Institute of Technology, Hyderabad
Bachelor of Technology (Computer Science and Engineering)
Programme Structure 2025-29

1.	OBJECTIVE	<p>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.</p> <p>The emphasis is to develop all round personality that would enable the students to take up the challenges of the corporate world and also become responsible citizens of the society.</p>			
2.	DURATION (IN MONTHS)	48 (Full Time)			
3.	INTAKE	120			
4.	RESERVATION	I. Within the sanctioned intake	a) SC (In Percentage)	b) ST (In Percentage)	c) Differently abled (In Percentage)
			15	7.5	3
		II. Over and above the sanctioned intake	a) Kashmiri Migrants (In Seats)		b) International Students (In Percentage)
			2		20
5.	ELIGIBILITY	<p>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</p> <p>Passed D.Voc. Stream in the same or allied sector.(The University will offer suitable bridge courses such as Mathematics, Physics, Engineering drawing, etc., for 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</p> <p>Passed B.Sc. Degree from a recognized University as defined by UGC, with atleast 45% marks (40% marks or equivalent grade for</p>			

		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 & SPECIALIZATION	Annexure A: Bachelor of Technology (Computer Science and Engineering) Students may pursue optional 'Honors' in one of the specialization areas by completing additional 20 credits in Semesters 5,6 and 7 as specified in Annexure B for the respective specialization area.: Annexure B: Optional 'Major ' specialization area 1. High Performance Computing 2. Data Science 3. IoT and Robotics 4. Game Design and Development

10.	FEE		Academic Fee p.a	Institute Deposit	Total
	Indian Students (Amount in INR)		2,70,000	20000	2,90,000
	International Students	NRI/ PIO/ OCI Category (Amount in US\$)			
		Foreign National Category (Amount in US\$)			
11.	ASSESSMENT	The courses will have 60% Continuous Assessment and 40% 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 examinations 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	<p>Bachelor of Technology (Computer Science and Engineering) OR Bachelor of Technology (Computer Science and Engineering) with Major in High Performance Computing/Data Science/ IoT and Robotics/Game Design and Development</p> <p>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.</p>			

14. CLASSIFICATION OF CREDITS

Semester	Generic Core	Generic Elective	Specialization Core	Specialization Elective	Open Elective	Mandatory Non-Credit Course/s	Non-Letter Grade Audit Course/s	Total
Common								
1	20	0	0	0	0	0	As per the student's choice	20
2	20	0	0	0	0	0		20
3	20	0	0	0	0	0		20
4	17	0	0	0	3	0		20
5	15	4	0	0	3	0		22
6	15	4	0	0	3	0		22
7(A)	14	8	0	0	0	0		22
7(B)	22	0	0	0	0	0		22
8	14	0	0	0	0	0		14
Total	135	16	0	0	9	0		
Optional Additional Courses (Honours)								
Total	0	0	20	0	0	0		20
Grand Total								180

Catalogue Course Code	Course Code	Course Title	Level	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total Marks
									Practical		Theory			
						L	T	Lab	CA	ESE	CA	ESE		
Semester :1														
Generic Core Courses														
		Calculus	1	BS		3	1	0	0	0	60	40	4	100
		Fundamentals of Quantum Physics	1	BS		3	0	2	15	10	45	30	4	100
		Digital Electronics and Logic Design	1	ES		2	0	2	15	10	30	20	3	75
		Programming Paradigm and Problem Solving	1	ES		2	0	2	15	10	30	20	3	75
		Software and Generative AI Tools	1	ES		0	0	2	15	10	0	0	1	25
		Tinker Lab	1	ES		0	0	4	50	0	0	0	2	50
		Critical Thinking	1	HS		1	0	0	0	0	25	0	1	25
		Indian Knowledge System	1	IKS		2	0	0	0	0	50	0	2	50
					Total	13	1	12	110	40	250	110	20	500
Semester :2														
Generic Core Courses														
		Linear Algebra	2	BS		2	1	0	0	0	45	30	3	75
		Microcontrollers and Sensors	2	ES		2	0	2	15	10	30	20	3	75
		Computer Architecture and Organization	1	PC		2	0	2	15	10	30	20	3	75
		Software Engineering	1	PC		2	0	2	15	10	30	20	3	75
		Python Programming	1	PC		2	0	2	15	10	30	20	3	75
		Cyber Security	1	ES		1	0	2	25	0	25	0	2	50
		Introduction to Environment and Sustainability	1	ES		0	0	2	25	0	0	0	1	25
		Technical Communication Skills	1	HS		0	0	2	25	0	0	0	1	25
		Creative Thinking	1	HS		0	0	2	25	0	0	0	1	25
		Health and Wellness - Module I				0	0	0	0	0	0	0	MC	Non Graded Course

		Carrier Essential - I*				0	0	0	0	0	0	0	MC	Non Graded Course
					Total	11	1	16	160	40	190	110	20	500
Semester :3														
Generic Core Courses														
		Discrete Mathematics	2	BS		2	1	0	0	0	45	30	3	75
		Data Structures	2	PC		2	0	4	30	20	30	20	4	100
		Operating Systems	2	PC		3	0	2	15	10	45	30	4	100
		Database Management Systems	2	PC		2	0	4	30	20	30	20	4	100
		Programming with JAVA	2	PC		0	0	4	30	20	0	0	2	50
		Flexi Course	2	PC		0	0	4	50	0	0	0	2	50
		Web Application Development	2	PC		0	0	2	15	10	0	0	1	25
		Health and Wellness - Module-II *			Others	0	0	0	0	0	0	0	MC	Non Graded Course
		Carrier Essential - II*				0	0	0	0	0	0	0	MC	Non Graded Course
					Total	9	1	20	170	80	150	100	20	500
Semester:4														
Generic Core Courses														
		Statistics and Probability	2	BS	Applied Sciences	2	1	0	0	0	45	30	3	75
		Computer Networks	2	PC	CSE and IT	3	0	2	15	10	45	30	4	100
		Design and Analysis of Algorithms	2	PC	CSE and IT	2	0	2	15	10	30	20	3	75
		Data Management and Visualization	2	PC		2	0	2	15	10	30	20	3	75
		Design Thinking and Creativity	2	HS	CSE and IT	0	0	2	25	0	0	0	1	25
		Project Based Learning-I	2	PIS	CSE and IT	0	0	4	50	0	0	0	2	50
		Advanced Python Lab	3	PC	Robotics and Automation	0	0	2	15	10	0	0	1	25
		Career Essential-III*	2			0	0	0	0	0	0	0	MC	Non Graded

														Course
					Total	9	1	14	135	40	150	100	17	425
Open Elective Courses Group - I (Choose Any One Course)														
		Physics for Quantum Computing	2	MOPE	Applied Science	2	1	0	0	0	45	30	3	75
		Mathematics for Data Science	2	MOPE	Applied Science	2	1	0	0	0	45	30	3	75
		Fundamentals of Machine Learning	2	MOPE	AIML	2	1	0	0	0	45	30	3	75
		AI System development	2	MOPE	AIML	2	1	0	0	0	45	30	3	75
		Smart Cities planning and management	2	MOPE	Civil	2	1	0	0	0	45	30	3	75
		Intelligent Waste Management Techniques	2	MOPE	Civil	2	1	0	0	0	45	30	3	75
		Web Technologies	2	MOPE	CSE	2	1	0	0	0	45	30	3	75
		Data Science	2	MOPE	CSE	2	1	0	0	0	45	30	3	75
		Engineering Simulation and Modelling Tools	2	MOPE	ETE	2	1	0	0	0	45	30	3	75
		Medical Electronics	2	MOPE	ETE	2	1	0	0	0	45	30	3	75
		3D Printing and Prototyping	2	MOPE	ME	2	1	0	0	0	45	30	3	75
		Battery Management Systems	2	MOPE	ME	2	1	0	0	0	45	30	3	75
		Fundamentals of Robotics and Automation	2	MOPE	Robotics and Automation	2	1	0	0	0	45	30	3	75
		Robot Process Automation	2	MOPE	Robotics and Automation	2	1	0	0	0	45	30	3	75
Semester :5														
Generic Core Courses														
		Theory of Computation	3	PC		3	0	0	0	0	45	30	3	75
		Cryptography and Information Security	3	PC		2	0	2	15	10	30	20	3	75
		Data Science and Business Intelligence	3	PC		2	0	2	15	10	30	20	3	75
		Introduction to Cloud Computing	2	PC		2	0	2	15	10	30	20	3	75
		Service Learning		HS		0	0	4	50	0	0	0	2	50
		Entrepreneurship Venture		HS		1	0	0	0	0	25	0	1	25

	Vasudhaiva Kutumbakam				0	0	0	0	0	0	0	0	MC	Non Graded Course
	Career Essential-IV*				0	0	0	0	0	0	0	0	MC	Non Graded Course
				Total	10	0	10	95	30	160	90	15	15	375
Generic Elective Courses Group - I (Choose Any One Course)														
	Cloud Computing Tools and Techniques	3	PE		3	0	2	25	0	75	0	4	4	100
	Advanced Computer Networks	3	PE		3	0	2	25	0	75	0	4	4	100
	Advances in Machine Learning	3	PE		3	0	2	25	0	75	0	4	4	100
	Data Warehousing and Mining	3	PE		3	0	2	25	0	75	0	4	4	100
	Essentials of Augmented and Virtual Reality	3	PE		3	0	2	25	0	75	0	4	4	100
	IoT Data Analytics	3	PE		3	0	2	25	0	75	0	4	4	100
				Total				25	0	75	0	4	4	100
Open Elective Courses Group - II (Choose Any One Course)														
	Financial Mathematics	3	MOPE	Applied Science	2	1	0	0	0	45	30	3	3	75
	Advanced Materials	3	MOPE	Applied Science	2	1	0	0	0	45	30	3	3	75
	Optimization for ML Systems	3	MOPE	AIML	2	1	0	0	0	45	30	3	3	75
	Deep Learning Essentials	3	MOPE	AIML	2	1	0	0	0	45	30	3	3	75
	Sustainability Engineering-Design and Innovation	3	MOPE	Civil	2	1	0	0	0	45	30	3	3	75
	Occupational Health and Safety Management	3	MOPE	Civil	2	1	0	0	0	45	30	3	3	75
	Introduction to Cloud Computing	3	MOPE	CSE	2	1	0	0	0	45	30	3	3	75
	Agile Methodologies	3	MOPE	CSE	2	1	0	0	0	45	30	3	3	75
	Embedded System & IoT	3	MOPE	ETE	2	1	0	0	0	45	30	3	3	75
	Introduction to 5G Technology	3	MOPE	ETE	2	1	0	0	0	45	30	3	3	75
	Electric and Hybrid Vehicles	3	MOPE	ME	2	1	0	0	0	45	30	3	3	75
	Six Sigma	3	MOPE	ME	2	1	0	0	0	45	30	3	3	75
	Industrial Robotics	3	MOPE	Robotics and	2	1	0	0	0	45	30	3	3	75

					Automation									
		PLC and SCADA	3	MOPE	Robotics and Automation	2	1	0	0	0	45	30	3	75
					Total				0	0	45	30	3	75
Semester : 6														
Generic Core Courses														
		Compiler Design	4	PC		2	0	2	15	10	30	20	3	75
		Distributed Systems	4	PC		2	0	2	15	10	30	20	3	75
		Block chain Technology	4	PC		2	0	2	15	10	30	20	3	75
		Flexi Course	4	PC		2	0	1	25	0	50	0	3	75
		Organizational Behaviour		HS		1	0	0	0	0	25	0	1	25
		Project Based Learning-II	4	PIS		0	0	4	50	0	0	0	2	50
		Career Essential-V*	4			0	0	0	0	0	0	0	MC	Non Graded Course
					Total	9	0	11	120	30	165	60	15	375
Generic Elective Courses Group - II (Choose Any One Course)														
		DevOps	4	PE		3	0	2	25	0	75	0	4	100
		Malware Analysis and Secure Coding	4	PE		3	0	2	25	0	75	0	4	100
		Computer Vision Applications	4	PE		3	0	2	25	0	75	0	4	100
		Pattern Recognition	4	PE		3	0	2	25	0	75	0	4	100
		Advance Databases	4	PE		3	0	2	25	0	75	0	4	100
		AR and VR Applications	4	PE		3	0	2	25	0	75	0	4	100
		IoT Security	4	PE		3	0	2	25	0	75	0	4	100
					Total				25	0	75	0	4	100
Open Elective Courses Group - III (Choose Any One Course)														
		Bioinformatics	4	MOPE	Applied Science	2	1	0	0	0	45	30	3	75
		Space Science	4	MOPE	Applied Science	2	1	0	0	0	45	30	3	75
		GenAI Tools and Techniques	4	MOPE	AIML	2	1	0	0	0	45	30	3	75
		Data Engineering	4	MOPE	AIML	2	1	0	0	0	45	30	3	75
		GIS and Remote Sensing Analytics	4	MOPE	Civil	2	1	0	0	0	45	30	3	75

		Environmental Impact Assessment	4	MOPE	Civil	2	1	0	0	0	45	30	3	75
		Software Testing and Quality Assurance	4	MOPE	CSE	2	1	0	0	0	45	30	3	75
		Introduction to AR-VR	4	MOPE	CSE	2	1	0	0	0	45	30	3	75
		Renewable Energy Systems	4	MOPE	ETE	2	1	0	0	0	45	30	3	75
		Semiconductor Technology Trends	4	MOPE	ETE	2	1	0	0	0	45	30	3	75
		Supply Chain Management	4	MOPE	ME	2	1	0	0	0	45	30	3	75
		Smart Manufacturing and Introduction of Industry 5.0	4	MOPE	ME	2	1	0	0	0	45	30	3	75
		Mobile Robotics	4	MOPE	Robotics and Automation	2	1	0	0	0	45	30	3	75
		Introduction to Aerial Robotics and Drone Technology	4	MOPE	Robotics and Automation	2	1	0	0	0	45	30	3	75
					Total				0	0	45	30	3	75
Semester : 7 (Plan A)														
Students will register for Scheme-A(Regular semester pattern)/ Scheme B (Internship/Entrepreneurship full time/GIP)/BTech(Research)														
Generic Core Courses														
		Big Data Analytics	4	PC		2	0	2	15	10	30	20	3	75
		Project Management and Practices	4	PC		2	0	0	0	0	30	20	2	50
		Flexi Course	4	PC		2	0	2	50	0	25	0	3	75
		B.Tech Project	4	PIS		0	0	8	60	40	0	0	4	100
		Flexi Course (MOOC)	4	PE		0	0	0	0	0	50	0	2	50
					Total	6	0	12	125	50	135	40	14	350
Generic Elective Courses Group - III (Choose Any One Course)														
		Cloud Security and Privacy	4	PE		3	0	2	25	0	75	0	4	100
		IoT in Smart Cities	4	PE		3	0	2	25	0	75	0	4	100
		Business and Finance Analytics	4	PE		3	0	2	25	0	75	0	4	100
		Building and Training Large Language Models	4	PE		3	0	2	25	0	75	0	4	100
		Human Computer Interface	4	PE		3	0	2	25	0	75	0	4	100
		Distributed Databases	4	PE		3	0	2	25	0	75	0	4	100

					Total				25	0	75	0	4	100
Generic Elective Courses Group - IV (Choose Any One Course)														
		High Performance Computing	4	PE		3	0	2	25	0	75	0	4	100
		Digital Forensics	4	PE		3	0	2	25	0	75	0	4	100
		Soft Computing	4	PE		3	0	2	25	0	75	0	4	100
		Information Storage & Retrieval	4	PE		3	0	2	25	0	75	0	4	100
		Robotics and AI	4	PE		3	0	2	25	0	75	0	4	100
		IT Infrastructure and Automation	4	PE		3	0	2	25	0	75	0	4	100
					Total				25	0	75	0	4	100
Semester : 7 (Plan B)														
Students will register for Scheme-A(Regular semester pattern)/ Scheme B (Internship/Entrepreneurship full time/GIP)/BTech(Research)														
Generic Core Courses														
		B.Tech Project		PIS		0	0	8	60	40	0	0	4	100
		Internship-I		PIS		0	0	20	250	0	0	0	10	250
		Seminar -I		PIS		0	0	10	75	50	0	0	5	125
		Flexi Course (MOOC)		PC		0	0	6	75	0	0	0	3	75
				Total		0	0	44	460	90	0	0	22	550
Semester : 8														
Generic Core Courses														
		Internship		PIS		0	0	24	180	120	0	0	12	300
		Seminar		PIS		0	0	4	30	20	0	0	2	50
				Total		0	0	28	210	140	0	0	14	350

Symbiosis Institute of Technology, Hyderabad
Science and Bachelor of Technology (Computer Science and Engineering)
Programme Structure 2025-29
Annexure A

Semester	Continuous Assessment	Term End Examination	Total Credits	Total Marks
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Semester 1			20	500
Semester 2			20	500
Semester 3			20	500
Semester 4			20	500
Semester 5			22	550
Semester 6			22	550
Semester 7			22	550
Semester 8			14	350
Total			160	4000

Catalogue Course Code	Course Code	Course Title	Level	Nature	Specialization/ Area/ Department	Annexure-B								Total Credits	Total Marks
						Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)						
						L	T	Lab	Practical		Theory				
									CA	ESE	CA	ESE			
Semester :5															
High Performance Computing															
		Advanced concepts in Machine Learning for HPC		PC		3	0	2	15	10	45	30	4	100	
		Introduction to High Performance Computing Architectures		PC		3	0	0	0	0	45	30	3	75	
Total						6	0	2	15	10	90	60	7	175	
Semester : 5															
Data Science															
		Statistical Inference and Modelling		PC		3	1	0	0	0	60	40	4	100	
		Deep Learning		PC		2	0	2	15	10	30	20	3	75	
Total						5	1	2	15	10	90	60	7	175	
Semester : 5															
IoT and Robotics															
		Automation and Robotics		PC		3	0	2	15	10	45	30	4	100	
		Basics of Internet of Things and Raspberry Pi		PC		2	0	2	15	10	30	20	3	75	
Total						5	0	4	30	20	75	50	7	175	
Semester : 5															
Game Design and Development															
		Introduction to AR, VR and XR		PC		3	0	2	15	10	45	30	4	100	
		Principles of Game Design		PC		2	0	2	15	10	30	20	3	75	
Total						5	0	4	30	20	75	50	7	175	
Semester : 6															
High Performance Computing															
		Numerical Methods and Algorithms for HPC		PC		3	0	0	0	0	45	30	3	75	

		Parallel and Distributed Computing		PC		3	0	0	0	0	45	30	3	75
					Total	6	0	0	0	0	90	60	6	150
Semester : 6														
Data Science														
		Natural Language Programming		PC		2	0	2	15	10	30	20	3	75
		Business Intelligence		PC		2	0	2	15	10	30	20	3	75
					Total	4	0	4	30	20	60	40	6	150
Semester : 6														
IoT and Robotics														
		Industrial Automation and Robotics		PC		2	0	2	15	10	30	20	3	75
		Industrial Internet of Things		PC		2	0	2	15	10	30	20	3	75
					Total	4	0	4	30	20	60	40	6	150
Semester : 6														
Game Design and Development														
		Design for Virtual Reality		PC		2	0	2	15	10	30	20	3	75
		Modern Tools in Game Development		PC		2	0	2	15	10	30	20	3	75
					Total	4	0	4	30	20	60	40	6	150
Semester : 7														
High Performance Computing														
		Honours Project		PIS		0	0	10	75	50	0	0	5	125
		Honours Seminar		PIS		0	0	4	30	20	0	0	2	50
					Total	0	0	14	105	70	0	0	7	175
Semester : 7														
Data Science														
		Honours Project		PIS		0	0	10	75	50	0	0	5	125
		Honours Seminar		PIS		0	0	4	30	20	0	0	2	50
					Total	0	0	14	105	70	0	0	7	175
Semester : 7														
IoT and Robotics														
		Honours Project		PIS		0	0	10	75	50	0	0	5	125

		Honours Seminar		PIS		0	0	4	30	20	0	0	2	50
					Total	0	0	14	105	70	0	0	7	175
Semester : 7														
Game Design and Development														
		Honours Project		PIS		0	0	10	75	50	0	0	5	125
		Honours Seminar		PIS		0	0	4	30	20	0	0	2	50
					Total	0	0	14	105	70	0	0	7	175

Symbiosis Institute of Technology, Hyderabad
Science and Bachelor of Technology (Computer Science and Engineering)
Programme Structure 2025-29 Annexure B
Optional 'Majors' Specialization

Semester	Continuous Assessment High Performance Computing	Term End Examination	Total Credits	Total Marks
High Performance Computing				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
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
IoT and Robotics				
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	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	0	20	20	500

