

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Information Technology)
Programme Structure 2019-23

1.	OBJECTIVE	<p>B.Tech is a full-time four year graduation programme, which aims at transforming a student into a technically sound professional. The syllabus contains courses on basic sciences, technical arts, humanities & liberal arts and professional courses. The mix of these courses has been evolved with an aim to produce professionals who have knowledge not only of Engineering but who are good managers to contribute in a cross-functional team and have human values.</p> <p>Being a professional programme it ensures a healthy balance between theoretical foundation and practical exposure to the present day world.</p> <p>The emphasis is to develop all round personality that would enable the students to take up the challenges of the corporate world and also become responsible citizens of the society.</p>			
2.	DURATION (IN MONTHS)	48 (Full Time)			
3.	INTAKE	60			
4.	RESERVATION	I. Within the sanctioned intake	a) SC (In Percentage)	b) ST (In Percentage)	c) Differently abled (In Percentage)
			15	7.5	3
		II. Over and above the sanctioned intake	a) Kashmiri Migrants (In Seats)	b) International Students (In Percentage)	
			2	15	
5.	ELIGIBILITY	<p>Passed 10+2 examination with Physics and Mathematics as compulsory subjects along with one of Chemistry/ Biotechnology/ Biology/ Technical Vocational subjects. Obtained at least 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste /Scheduled Tribes) in the above subjects taken together.</p> <p>B. Tech (Lateral entry to second year) :</p> <p>a) Passed Diploma examination from an AICTE approved Institution; with at least 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste /Scheduled Tribes) in appropriate branch of Engineering / Technology.</p> <p>b) Passed B.Sc. Degree from a recognized University as defined by UGC, with at least 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste /Scheduled Tribes) and passed XII standard with mathematics as a subject.</p> <p>c) Provided that in case of students belonging to B. Sc. Stream, shall clear the subjects of Engineering Graphics / Engineering Drawing and Engineering Mechanics of the first year Engineering program along with the second year subjects.</p> <p>d) Provided further that, the students belonging to B. Sc. Stream shall be considered only after filling the supernumerary seats in this category with students belonging to the Diploma stream.</p> <p>e) Provided further that students, who have passed Diploma in Engineering and Technology from an AICTE approved Institution or B. Sc. Degree from a recognized University as defined by UGC, shall also be eligible for admission to</p>			

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		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 valid score of Symbiosis Entrance Test (SET) or Joint Entrance Examination (JEE - Main) or Maharashtra Common Entrance Test (MHT-CET)			
7.	MEDIUM OF INSTRUCTION	English			
8.	PROGRAMME PATTERN	Semester			
9.	COURSE & SPECIALIZATION	As per Annexure A Students can pursue additional specialization in the following areas by completing 20 credits specified in the program structure of that specialization beyond the minimum requirement for the award of degree. AI and Machine learning, Data Science, Computing, Game Design & Development, Security and Privacy, Internet of Things			
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) 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. NATURE WISE DISTRIBUTION OF CREDITS							
Semester	Generic Core	Generic Elective	Specialization Core	Specialization Elective	Open Elective	Audit	Total
1	20	0	0	0	0	0	20
2	19	0	0	0	0	0	19
3	23	1	0	0	0	0	24
4	17	2	0	0	0	1*	19
5	22	3	0	0	0	0	25
6	14	11	0	0	0	0	25
7	11	13	0	0	0	0	24
8	14	0	0	0	0	0	14
Total	140	30	0	0	0	0	170
Optional Additional Courses							
Total	0	0	20	0	0	0	20
Grand Total							190

* Satisfactory completion of the letter grade course 'Integrated Disaster Management' is mandatory for award of degree.

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

Programme Structure is approved by the Academic Council subject to its norms & conditions. Any provision in the Programme Structure which violates the basic rules & regulations is deemed to be termed "Null & Void".

Head-Academics

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Annexure A

Catalog Course Code	Course Code	Course Title	Specialization	Credits	Internal Marks	External Mark	Internal Practical Marks	External Practical Marks	Total Marks
Semester : 1									
Generic Core Courses									
TE7168	070124101	Engineering Mathematics -I		4	40	60	0	0	100
T7391	070124102	Physics		3	30	45	0	0	75
TE7288	070124103	Programming in C		3	30	45	0	0	75
T7383	070124104	Communication Skills		2	20	30	0	0	50
TE7188	070124105	Environmental Science		2	20	30	0	0	50
TE7300	070124106	Tinker Lab		2	0	0	50	0	50
T7392	070124107	Physics lab		1	0	0	10	15	25
TE7139	070124108	Communication Skills Lab		1	0	0	10	15	25
TE7289	070124109	Programming in C Lab		1	0	0	10	15	25
T6773	070124110	Creative Thinking		1	25	0	0	0	25
Total				20	165	210	80	45	500
Semester : 2									
Generic Core Courses									
TE7169	070124201	Engineering Mathematics -II		4	40	60	0	0	100
T7540	070124202	Basic Electrical and Electronics Engineering		3	30	45	0	0	75
T7381	070124203	Chemistry		3	30	45	0	0	75
T7924	070124204	Engineering Graphics		2	0	0	20	30	50
TE7286	070124205	Programming and Problem Solving		2	20	30	0	0	50
T7593	070124206	Basic Electrical and Electronics Engineering Lab		1	0	0	10	15	25
T7382	070124207	Chemistry Lab		1	0	0	10	15	25
T6732	070124208	Critical Thinking		1	25	0	0	0	25
TE7287	070124209	Programming and Problem Solving Lab		1	0	0	10	15	25
TE7396	070124210	Software Tools		1	25	0	0	0	25
Total				19	170	180	50	75	475
Semester : 3									
Generic Core Courses									
T7995	070124301	Discrete Mathematics and Probability Theory		4	40	60	0	0	100
T7906	070124302	Fundamentals of Data Structures		3	30	45	0	0	75
T7512	070124303	Programming Paradigms		3	30	45	0	0	75
T7996	070124304	Computer Organization		3	30	45	0	0	75
T7997	070124305	Digital Electronics and Logic Design		3	30	45	0	0	75
F0003	070124306	Flexi-Credit Course		3	75	0	0	0	75
T7555	070124307	Digital Electronics and Logic Design Lab		1	0	0	10	15	25
T2646	070124308	Entrepreneurship Venture		1	25	0	0	0	25
T7513	070124309	Programming Paradigms Lab		1	0	0	10	15	25
TE7257	070124310	Fundamentals of Data Structures Lab		1	0	0	10	15	25
Total				23	260	240	30	45	575
Generic Elective Courses Group									
T6761	070124311	Foundation of Ethics		1	25	0	0	0	25
T6760	070124312	Introduction to Indian Philosophy		1	25	0	0	0	25

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Catalog Course Code	Course Code	Course Title	Specialization	Credits	Internal Marks	External Mark	Internal Practical Marks	External Practical Marks	Total Marks
Total Required Credits				1	25	0	0	0	25
Semester : 4									
Generic Core Courses									
F0004	070124401	Flexi-Credit Course		4	100	0	0	0	100
T7488	070124402	Data Structures		3	30	45	0	0	75
T7510	070124403	Operating Systems		3	30	45	0	0	75
TE7170	070124404	Engineering Mathematics-III		3	30	45	0	0	75
TE7290	070124405	Project Based Learning -I		2	0	0	20	30	50
T7489	070124406	Data Structures Lab		1	0	0	10	15	25
T7511	070124407	Operating Systems Lab		1	0	0	10	15	25
T4005	070124408	Integrated Disaster Management *		0	0	0	0	0	Letter Grade
Total				17	190	135	40	60	425
Generic Elective Courses Group									
T6012	070124409	Basic German I		2	50	0	0	0	50
T6014	070124410	Basic French I		2	50	0	0	0	50
T6016	070124411	Basic Spanish I		2	50	0	0	0	50
Total Required Credits				2	50	0	0	0	50
Semester : 5									
Generic Core Courses									
T8000	070124501	Service Learning		4	100	0	0	0	100
F0004	070124502	Flexi-Credit Course		4	100	0	0	0	100
T7908	070124503	Computer Networks		3	30	45	0	0	75
T7907	070124504	Database Management Systems		3	30	45	0	0	75
TE7299	070124505	Theory of Computation		3	30	45	0	0	75
T7487	070124506	Data Base Management Systems Lab		2	0	0	20	30	50
T6774	070124507	Principles of Economics		2	50	0	0	0	50
T7482	070124508	Computer Networks Lab		1	0	0	10	15	25
Total				22	340	135	30	45	550
Specialization Core Courses for Optional Additional Specialization : AI and Machine Learning (Major)									
TE7273	070124509	Machine Learning: Classification	AI and Machine Learning	3	30	45	0	0	75
TE7274	070124510	Machine Learning: Regression	AI and Machine Learning	3	30	45	0	0	75
Total				6	60	90	0	0	150
Specialization Core Courses for Optional Additional Specialization : Computing (Major)									
T7476	070124511	Cloud Computing	Computing	3	30	45	0	0	75
TE7250	070124512	Cloud Environment in Public Model	Computing	3	30	45	0	0	75
Total				6	60	90	0	0	150
Specialization Core Courses for Optional Additional Specialization : Data Science (Major)									
TE7281	070124513	Open Source Tools for Data Science	Data Science	4	40	60	0	0	100
TE7292	070124514	R Programming	Data Science	3	30	45	0	0	75
Total				7	70	105	0	0	175
Specialization Core Courses for Optional Additional Specialization : Game Design & Development (Major)									
TE7267	070124515	Introduction to Game Development	Game Design & Development	3	30	45	0	0	75
TE7285	070124516	Principles of Game Design	Game Design & Development	3	30	45	0	0	75

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Total				6	60	90	0	0	150
Specialization Core Courses for Optional Additional Specialization : Internet of Things (Major)									
TE7268	070124517	Introduction to IOT	Internet of Things	4	40	60	0	0	100
TE7293	070124518	Raspberry Pi and Python	Internet of Things	3	30	45	0	0	75
Total				7	70	105	0	0	175
Specialization Core Courses for Optional Additional Specialization : Security and Privacy (Major)									
TE7296	070124519	Software Security	Security and Privacy	3	30	45	0	0	75
TE7301	070124520	Usable Security	Security and Privacy	3	30	45	0	0	75
Total				6	60	90	0	0	150
Generic Elective Courses Group									
T7574	070124521	MATLAB		3	30	45	0	0	75
TE7335	070124522	Introduction to Robotics		3	30	45	0	0	75
TE7339	070124523	Renewable Energy Systems		3	30	45	0	0	75
TE7332	070124524	Introduction to Image Processing		3	30	45	0	0	75
TE7223	070124525	Smart Urban Planning		3	30	45	0	0	75
TE7240	070124526	Water Resource Planning and Management		3	30	45	0	0	75
T7499	070124527	Java		3	30	45	0	0	75
TE7265	070124528	Introduction to Data Science		3	30	45	0	0	75
TE7263	070124529	Introduction to AI and Machine Learning		3	30	45	0	0	75
TE7388	070124530	Quality Management Techniques		3	30	45	0	0	75
TE7365	070124531	Electrical and Electronics Materials		3	30	45	0	0	75
TE7351	070124532	3D Printing and Prototyping		3	30	45	0	0	75
T2618	070124533	Project Management		3	30	45	0	0	75
T7020	070124534	Nanotechnology		3	30	45	0	0	75
T7393	070124535	Computer Based Statistical Packages		3	30	45	0	0	75
Total Required Credits				3	30	45	0	0	75
Semester : 6									
Generic Core Courses									
T2658	070124	Design Thinking		2	50	0	0	0	50
TE7008	070124601	Distributed Systems and Resource Management		3	30	45	0	0	75
F0003	070124602	Flexi-Credit Course		3	75	0	0	0	75
T7674	070124603	Cyber Security		2	50	0	0	0	50
TE7291	070124605	Project Based Learning-II		2	20	30	0	0	50
T7802	070124606	Capstone Course		2	0	0	20	30	50
Total				14	225	75	20	30	350
Specialization Core Courses for Optional Additional Specialization : AI and Machine Learning (Major)									
TE7266	070124607	Introduction to Deep Learning	AI and Machine Learning	4	40	60	0	0	100
TE7271	070124608	Machine Learning Clustering and Retrieval	AI and Machine Learning	3	30	45	0	0	75
Total				7	70	105	0	0	175

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Specialization Core Courses for Optional Additional Specialization : Computing (Major)									
TE7246	070124609	Block Chain	Computing	4	40	60	0	0	100
TE7249	070124610	Cloud Computing Platforms	Computing	3	30	45	0	0	75
Total				7	70	105	0	0	175
Specialization Core Courses for Optional Additional Specialization : Data Science (Major)									
T2228	070124611	Business Analytics	Data Science	3	30	45	0	0	75
TE7284	070124612	Power BI	Data Science	3	30	45	0	0	75
Total				6	60	90	0	0	150
Specialization Core Courses for Optional Additional Specialization : Game Design & Development (Major)									
TE7275	070124613	Modern Platforms in Game Development	Game Design & Development	4	40	60	0	0	100
TE7256	070124614	Entrepreneurship in Game Development	Game Design & Development	3	30	45	0	0	75
Total				7	70	105	0	0	175
Specialization Core Courses for Optional Additional Specialization : Internet of Things (Major)									
TE7269	070124615	IOT Security and Privacy	Internet of Things	3	30	45	0	0	75
TE7295	070124616	Software Defined Networking	Internet of Things	3	30	45	0	0	75
Total				6	60	90	0	0	150
Specialization Core Courses for Optional Additional Specialization : Security and Privacy (Major)									
TE7252	070124617	Cryptography	Security and Privacy	4	40	60	0	0	100
TE7258	070124618	Hardware Security	Security and Privacy	3	30	45	0	0	75
Total				7	70	105	0	0	175
Generic Elective Courses Group									
TE7255	070124619	Data Warehousing and Mining		3	30	45	0	0	75
TE7101	070124620	Internet of Things		3	30	45	0	0	75
TE7328	070124621	Image Processing		3	30	45	0	0	75
Total Required Credits				3	30	45	0	0	75
Generic Elective Courses Group									
TE7013	070124622	Data Warehousing and Mining Lab		1	0	0	10	15	25
T7528	070124623	Internet Of Things Lab		1	0	0	10	15	25
TE7329	070124624	Image Processing Lab		1	0	0	10	15	25
Total Required Credits				1	0	0	10	15	25
Generic Elective Courses Group									
T7473	070124625	Artificial Intelligence		3	30	45	0	0	75
TE7259	070124626	Human Computer Interface		3	30	45	0	0	75
TE7243	070124627	Advanced Algorithms		3	30	45	0	0	75
Total Required Credits				3	30	45	0	0	75
Generic Elective Courses Group									
TE7014	070124628	Artificial Intelligence Lab		1	0	0	10	15	25
TE7260	070124629	Human Computer Interface Lab		1	0	0	10	15	25
TE7244	070124630	Advanced Algorithms Lab		1	0	0	10	15	25
Total Required Credits				1	0	0	10	15	25

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Generic Elective Courses Group									
TE7338	070124631	Principles of Modern Communication Systems		3	30	45	0	0	75
T7584	070124632	Printed Circuit Board (PCB) Design		3	30	45	0	0	75
T7529	070124633	Machine Learning		3	30	45	0	0	75
TE7334	070124634	Introduction to Mechatronics		3	30	45	0	0	75
TE7195	070124635	GIS Applications		3	30	45	0	0	75
TE7204	070124636	Intelligent Transportation Systems		3	30	45	0	0	75
T7509	070124637	Open Source Technologies		3	30	45	0	0	75
T7474	070124638	Basics of Database		3	30	45	0	0	75
TE7264	070124639	Introduction to BIGDATA		3	30	45	0	0	75
T7650	070124640	Six sigma		3	30	45	0	0	75
TE7377	070124641	Introduction to Optimisation		3	30	45	0	0	75
T7616	070124642	Fundamentals of Automotive Technology		3	30	45	0	0	75
TE7376	070124643	Introduction to Operations Research		3	30	45	0	0	75
T7394	070124644	Smart Materials		3	30	45	0	0	75
TE7171	070124645	Introduction to Mathematical Modelling		3	30	45	0	0	75
Total Required Credits				3	30	45	0	0	75
Semester : 7									
Generic Core Courses									
T7804	070124701	Project		4	40	60	0	0	100
TE7294	070124702	Search Engine Optimization		4	40	60	0	0	100
F0003	070124703	Flexi-Credit Course		3	75	0	0	0	75
Total				11	155	120	0	0	275
Specialization Core Courses for Optional Additional Specialization : AI and Machine Learning (Major)									
T7805	070124704	Project	AI and Machine Learning	5	0	0	50	75	125
T7802	070124705	Seminar	AI and Machine Learning	2	0	0	20	30	50
Total				7	0	0	70	105	175
Specialization Core Courses for Optional Additional Specialization : Computing (Major)									
T7805	070124704	Project	Computing	5	0	0	50	75	125
T7802	070124705	Seminar	Computing	2	0	0	20	30	50
Total				7	0	0	70	105	175
Specialization Core Courses for Optional Additional Specialization : Data Science (Major)									
T7805	070124704	Project	Data Science	5	0	0	50	75	125
T7802	070124705	Seminar	Data Science	2	0	0	20	30	50
Total				7	0	0	70	105	175
Specialization Core Courses for Optional Additional Specialization : Game Design & Development (Major)									
T7805	070124704	Project	Game Design & Development	5	0	0	50	75	125
T7802	070124705	Seminar	Game Design & Development	2	0	0	20	30	50
Total				7	0	0	70	105	175
Specialization Core Courses for Optional Additional Specialization : Internet of Things (Major)									
T7805	070124704	Project	Internet of Things	5	0	0	50	75	125

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T7802	070124705	Seminar	Internet of Things	2	0	0	20	30	50
Total				7	0	0	70	105	175
Specialization Core Courses for Optional Additional Specialization : Security and Privacy (Major)									
T7805	070124704	Project	Security and Privacy	5	0	0	50	75	125
T7802	070124705	Seminar	Security and Privacy	2	0	0	20	30	50
Total				7	0	0	70	105	175
Generic Elective Courses Group									
T6004	070124706	Organizational Behavior		2	50	0	0	0	50
TE7438	070124707	History of Science and Technology		2	50	0	0	0	50
Total Required Credits				2	50	0	0	0	50
Generic Elective Courses Group									
TE7097	070124708	Neural Network		3	30	45	0	0	75
TE7253	070124709	Data Science		3	30	45	0	0	75
TE7282	070124710	Optimization Techniques and Algorithms		3	30	45	0	0	75
Total Required Credits				3	30	45	0	0	75
Generic Elective Courses Group									
TE7112	070124711	Neural Networks Lab		1	0	0	10	15	25
TE7254	070124712	Data Science Lab		1	0	0	10	15	25
TE7283	070124713	Optimization Techniques and Algorithms Lab		1	0	0	10	15	25
Total Required Credits				1	0	0	10	15	25
Generic Elective Courses Group									
T7529	070124714	Machine Learning		3	30	45	0	0	75
T7138	070124715	Network Security		3	30	45	0	0	75
TE7103	070124716	Natural Language Processing		3	30	45	0	0	75
Total Required Credits				3	30	45	0	0	75
Generic Elective Courses Group									
TE7105	070124717	Machine Learning Lab		1	0	0	10	15	25
T7506	070124718	Network Security Lab		1	0	0	10	15	25
TE7106	070124719	Natural Language Processing Lab		1	0	0	10	15	25
Total Required Credits				1	0	0	10	15	25
Generic Elective Courses Group									
TE7251	070124720	Computer Graphics		3	30	45	0	0	75
TE7297	070124721	Software Testing Tools		3	30	45	0	0	75
T7476	070124722	Cloud Computing		3	30	45	0	0	75
Total Required Credits				3	30	45	0	0	75
Semester : 8									
Generic Core Courses									
T7912	070124801	Internship		12	0	0	170	130	300
T7802	070124802	Seminar		2	0	0	50	0	50

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Total				14	0	0	220	130	350
GIP									
G7012	070124803	Global Immersion Programme		12	0	0	0	0	300

Note: For students under Global Immersion Programme (070124803), course "Internship" (070124801) will be waived off.

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Semester	Internal Credits	External Credits	Total Credits	Total Marks
Semester 1	3	17	20	500
Semester 2	2	17	19	475
Semester 3	5	19	24	600
Semester 4	6	13	19	475
Semester 5	10	15	25	625
Semester 6	7	18	25	625
Semester 7	5	19	24	600
Semester 8	2	12	14	350
Total	40	130	170	4250