



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

1.	OBJECTIVE	To generate competent manpower in the emerging areas of Artificial Intelligence and Machine Learning. To inculcate among the students an aptitude for engineering and research in the area of Artificial Intelligence and Machine Learning for generation of better and smarter solutions to real world problems.			
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		15
5.	ELIGIBILITY	Passed Standard XII (10+2) or equivalent examination with Physics and Mathematics as compulsory subjects along with one of the Chemistry/ Biotechnology/ Biology/ Technical Vocational subject/ Computer Science/ Information Technology/ Informatics Practices/ Agriculture/ Engineering Graphics/ Business Studies from any recognised Board with a minimum of 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste/ Scheduled Tribes).			
6.	SELECTION PROCEDURE	Selection would be based on joint merit of entrance exam score and PCM/PMV aggregate percentage.			
7.	MEDIUM OF INSTRUCTION	English			
8.	PROGRAMME PATTERN	Semester			
9.	COURSE &	As per Annexure A			



Symbiosis Institute of Technology, Pune
Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

	SPECIALIZATION				
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 (Artificial Intelligence and Machine Learning) 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 10.00 CGPA.			

14. CLASSIFICATION OF CREDITS

Semester	Generic Core	Generic Elective	Specialization Core	Specialization Elective	Open Elective	Audit	Total
1	20	0	0	0	0	1*	20
2	19	0	0	0	0	1*	19
3	20	1	0	0	0	0	21
4	23	2	0	0	0	1*	25
5	23	0	0	0	3	0	26
6	10	11	0	0	3	0	24
7	12	9	0	0	0	0	21
8	14	0	0	0	0	0	14
Total	141	23	0	0	6	0	170

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

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.

Head - Academics

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Symbiosis Institute of Technology, Pune
Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

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	La b	CA	ESE	CA	ESE		
Semester : 1													
Generic Core Courses													
TE7697	0701260101	Linear Algebra	BS		2	1	0	0	0	30	45	3	75
TE7545	0701260102	Chemistry	BS		2	0	0	0	0	20	30	2	50
TE7695	0701260103	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
T7540	0701260104	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	0701260105	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
TE7556	0701260106	Introduction to Python Programming	ES		3	0	0	0	0	30	45	3	75
TE7555	0701260107	Introduction to Python Programming Lab	ES		0	0	2	10	15	0	0	1	25
T6732	0701260108	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
T7674	0701260109	Cyber Security	PC		2	0	0	0	0	50	0	2	50
T2646	0701260110	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
TE7300	0701260111	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
TH4095	0701260112	Fitness for Life *			0	0	0	0	0	0	0	Non Letter Grade	0
Total					14	1	10	80	45	210	165	20	500
Semester : 2													
Generic Core Courses													





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Symbiosis Institute of Technology, Pune
Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

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								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7693	0701260201	Calculus	BS		2	1	0	0	0	30	45	3	75
TE7540	0701260202	Physics	BS		2	0	0	0	0	20	30	2	50
TE7687	0701260203	Physics Lab	BS		0	0	2	10	15	0	0	1	25
TE7288	0701260204	Programming in C	ES		3	0	0	0	0	30	45	3	75
TE7289	0701260205	Programming in C Lab	ES		0	0	2	10	15	0	0	1	25
T7383	0701260206	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	0701260207	Communication skills lab	HS		0	0	2	10	15	0	0	1	25
T6873	0701260208	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
TE7690	0701260209	Statistics for Data Science	BS		3	1	0	0	0	40	60	4	100
TE7748	0701260210	Software Tools for Artificial Intelligence and Machine Learning	BS		0	0	2	25	0	0	0	1	25
TE7188	0701260211	Environmental Science *			0	0	0	0	0	0	0	Non Letter Grade	0
Total					13	2	8	55	45	165	210	19	475
Semester : 3													
Generic Core Courses													
TE7699	0701260301	Probability and Random Processes	BS		2	1	0	0	0	30	45	3	75
TE7759	0701260302	Python for Data Science	PC		0	0	2	10	15	0	0	1	25
TE7544	0701260303	Data Structures and Algorithms	PC		3	0	0	0	0	30	45	3	75





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Symbiosis Institute of Technology, Pune
Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

Annexure A

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								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7546	0701260304	Data Structures and Algorithms Lab	PC		0	0	4	20	30	0	0	2	50
TE7547	0701260305	Data Preprocessing Lab	PC		0	0	4	20	30	0	0	2	50
TE7755	0701260306	Exploratory Data Analysis Lab	ES		0	0	4	20	30	0	0	2	50
TE7752	0701260307	Database Concepts for Data Science Lab	ES		0	0	2	10	15	0	0	1	25
T6749	0701260308	Design Thinking	HS		2	0	0	0	0	50	0	2	50
F0003	0701260309	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
F0001	0701260310	Flexi-Credit Course	PC		0	0	2	25	0	0	0	1	25
Total					10	1	18	105	120	185	90	20	500
Generic Elective Courses Group													
T6872	0701260311	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25
T6760	0701260312	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													
TE7483	0701260401	Applications and use cases of Machine Learning	PC		0	0	4	20	30	0	0	2	50
F0003	0701260402	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
F0001	0701260403	Flexi-Credit Course	PC		0	0	2	25	0	0	0	1	25
TE7499	0701260404	Supervised Machine Learning	PC		4	0	0	0	0	40	60	4	100





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Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

Annexure A

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								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7500	0701260405	Supervised Machine Learning Lab	PC		0	0	4	20	30	0	0	2	50
TE7760	0701260406	Unsupervised Learning	PC		3	0	0	0	0	30	45	3	75
TE7761	0701260407	Unsupervised Learning Lab	PC		0	0	2	10	15	0	0	1	25
TE7529	0701260408	AI Ethics	PC		2	0	0	0	0	20	30	2	50
TE7757	0701260409	Optimization Techniques for Machine Learning	PC		2	0	0	0	0	20	30	2	50
TE7696	0701260410	Discrete Mathematics	BS		2	1	0	0	0	30	45	3	75
T4005	0701260411	Integrated Disaster Management *	MC		0	0	0	0	0	0	0	Non Letter Grade	0
Total					16	1	12	75	75	215	210	23	575
Generic Elective Courses Group													
T6184	0701260412	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6186	0701260413	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6188	0701260414	Basic Spanish I	GE		2	0	0	0	0	50	0	2	50
Total Required Credits								0	0	50	0	2	50
Semester : 5													
Generic Core Courses													
T8000	0701260501	Service Learning	HS		0	0	8	100	0	0	0	4	100



Celebrating 50 Years of Excellence

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Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

Annexure A

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								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
F0003	0701260502	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
TE7753	0701260503	Deep Learning	PC		3	0	0	0	0	30	45	3	75
TE7754	0701260504	Deep Learning Lab	PC		0	0	2	10	15	0	0	1	25
TE7490	0701260505	Generative Adversarial Networks	PC		3	0	0	0	0	30	45	3	75
TE7491	0701260506	Generative Adversarial Networks Lab	PC		0	0	2	10	15	0	0	1	25
TE7663	0701260507	Data Visualization Lab	PC		0	0	4	20	30	0	0	2	50
T6774	0701260508	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
T7908	0701260509	Computer Networks	PC		3	0	0	0	0	30	45	3	75
T7482	0701260510	Computer Networks Lab	PC		0	0	2	10	15	0	0	1	25
Total					14	0	18	150	75	215	135	23	575
Open Elective Courses Group													
TE7677	0701260511	Financial Mathematics	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7700	0701260512	Smart Materials	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7223	0701260513	Smart Urban Planning	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7240	0701260514	Water Resource Planning and Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
T7499	0701260515	Java	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7750	0701260516	Web Application Development	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75



Celebrating 50 Years of Excellence

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Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

Annexure A

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								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
T7574	0701260517	MATLAB	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7428	0701260518	Introduction to Image Processing	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7810	0701260519	Industrial Revolution and Introduction of Industry 5.0	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
T7650	0701260520	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													
TE7276	0701260601	Natural Language Processing	PC		3	0	0	0	0	30	45	3	75
TE7277	0701260602	Natural Language Processing Lab	PC		0	0	2	10	15	0	0	1	25
TE7565	0701260603	Reinforcement Learning	PC		3	0	0	0	0	30	45	3	75
TE7496	0701260604	Reinforcement Learning Lab	PC		0	0	2	10	15	0	0	1	25
T7802	0701260605	Capstone Course	PC		2	0	0	0	0	50	0	2	50
Total					8	0	4	20	30	110	90	10	250
Generic Elective Courses Group- I													
TE7484	0701260606	Computer Vision	PE		3	0	0	0	0	30	45	3	75



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

Annexure A

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								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7261	0701260607	Internet of Things	PE		3	0	0	0	0	30	45	3	75
TE7549	0701260608	Cloud Computing and Distributed Systems	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group- II													
TE7485	0701260609	Computer Vision Lab	PE		0	0	2	10	15	0	0	1	25
TE7262	0701260610	Internet of Things Lab	PE		0	0	2	10	15	0	0	1	25
TE7550	0701260611	Cloud computing and Distributed Systems lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								10	15	0	0	1	25
Generic Elective Courses Group- III													
TE7562	0701260612	Speech Systems	PE		3	0	0	0	0	30	45	3	75
TE7255	0701260613	Data Warehousing and Mining	PE		3	0	0	0	0	30	45	3	75
TE7536	0701260614	Embedded AI	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group- IV													
TE7563	0701260615	Speech Systems Lab	PE		0	0	2	10	15	0	0	1	25
TE7013	0701260616	Data Warehousing and Mining Lab	PE		0	0	2	10	15	0	0	1	25
TE7535	0701260617	Embedded AI Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								10	15	0	0	1	25



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

Annexure A

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								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Generic Elective Courses Group- V													
TE7534	0701260618	Healthcare informatics	PE		3	0	0	0	0	30	45	3	75
TE7548	0701260619	Cognitive Systems	PE		3	0	0	0	0	30	45	3	75
TE7551	0701260620	Block chain Technologies	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Open Elective Courses Group													
TE7698	0701260621	Nanotechnology	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7676	0701260622	Executive Corporate Communication For Impact	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7195	0701260623	GIS Applications	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7203	0701260624	Intelligent Transportation Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7297	0701260625	Software Testing Tools	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7756	0701260626	Open Source Technologies	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
T7584	0701260627	Printed Circuit Board (PCB) Design	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7334	0701260628	Introduction to Mechatronics	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75



Celebrating 50 Years of Excellence

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Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

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								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7804	0701260629	Design Optimization Techniques	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7351	0701260630	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	0701260701	B.Tech Project	PIS		0	0	8	40	60	0	0	4	100
TE7493	0701260702	Multimodal AI	PC		3	0	0	0	0	30	45	3	75
TE7494	0701260703	Multimodal AI Lab	PC		0	0	2	10	15	0	0	1	25
TE7552	0701260704	Big Data Analytics	PC		3	0	0	0	0	30	45	3	75
TE7554	0701260705	Big Data Analytics Lab	PC		0	0	2	10	15	0	0	1	25
Total					6	0	12	60	90	60	90	12	300
Generic Elective Courses Group- I													
T2585	0701260706	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50
TE7438	0701260707	History of Science and Technology	GE		2	0	0	0	0	50	0	2	50
Total Required Credits								0	0	50	0	2	50
Generic Elective Courses Group- II													
TE7564	0701260708	AI in Wireless Communications	PE		3	0	0	0	0	30	45	3	75
TE7497	0701260709	Responsible AI	PE		3	0	0	0	0	30	45	3	75
TE7560	0701260710	Robotic Process Automation	PE		3	0	0	0	0	30	45	3	75





Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group- III													
TE7561	0701260711	AI in Wireless Communications Lab	PE		0	0	2	10	15	0	0	1	25
TE7498	0701260712	Responsible AI Lab	PE		0	0	2	10	15	0	0	1	25
TE7559	0701260713	Robotic Process Automation Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								10	15	0	0	1	25
Generic Elective Courses Group- IV													
TE7553	0701260714	Industry 4.0	PE		3	0	0	0	0	30	45	3	75
TE7532	0701260715	Smart Society	PE		3	0	0	0	0	30	45	3	75
TE7533	0701260716	AI for Banking and Finance	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 8													
Generic Core Courses													
T7912	0701260801	Internship	PIS		0	0	24	120	180	0	0	12	300
T7802	0701260802	Seminar	PIS		0	0	4	20	30	0	0	2	50
		Total			0	0	28	140	210	0	0	14	350



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Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26

Annexure A

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



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Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2022-26
Annexure A

Semester	Internal Credits	External Credits	Total Credits	Total Marks
Semester 1	6	14	20	500
Semester 2	2	17	19	475
Semester 3	7	14	21	525
Semester 4	6	19	25	625
Semester 5	9	17	26	650
Semester 6	2	22	24	600
Semester 7	2	19	21	525
Semester 8	0	14	14	350
Total	34	136	170	4250