Symbiosis Institute of Technology, Hyderabad

Bachelor of Technology (Artificial Intelligence and Machine Learning)

Programme Structure 2024-28

1.	**OBJECTIVE**	To generate competent manpower in the emerging areas of AI and Machine Learning. To inculcate among the students an aptitude for engineering and research in the area of AI and ML for generation of better and smarter solutions to real world problems.			
2.	**DURATION (IN MONTHS)**	48 (Full Time)			
3.	**INTAKE**	**30**			
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**	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 recognized 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 & SPECIALIZATION	**Annexure A (Artificial Intelligence and Machine Learning)**			
10.	FEE		**Academic Fee p.a**	**Institute Deposit**	**Total**
		Indian Students	**330000**	**20000**	**350000**
		International Students (USD equivalent to INR	**6300**	**275**	**6575**
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 CGPA.			
14.	**CLASSIFICATION OF CREDITS**				

Semester	Generic Core	Generic Elective	Specialization Core	Specialization Elective	Open Elective	Non-Credit Courses	Audit Courses	Total
1	20	0	0	0	0	0	As per Students Choice	20
2	19	0	0	0	0	2*		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	10	0	0	3	0		23
7	12	10	0	0	0	0		22
8	14	0	0	0	0	0		14
Total	**141**	**23**	**0**	**0**	**6**	**0**		**170**

*Satisfactory completion of the Non-credit courses 'Integrated Disaster Management', 'Fitness for Life', 'Environmental Science' is mandatory for the award of degree.

Symbiosis Institute of Technology, Hyderabad
Bachelor of Technology (Artificial Intelligence and Machine Learning)
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 Marks
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester :1													
Generic Core Courses													
TE7697	101	Linear Algebra	BS		2	1	0	0	0	30	45	3	75
TE7545	102	Chemistry	BS		2	0	0	0	0	20	30	2	50
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
P2996	106	Introduction to AI and Python Programming	ES		3	0	0	0	0	30	45	3	75
P2997	107	Introduction to AI and Python Programming Lab	ES		0	0	2	10	15	0	0	1	25
T6732	108	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
P2939	109	Cyber Security	PC		2	0	0	0	0	50	0	2	50
T2646	110	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
TE7300	111	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
				Total	14	1	10	80	45	210	165	20	500
Semester :2													
Generic Core Courses													
TE7543	201	Calculus	BS		2	1	0	0	0	30	45	3	75
TE7540	202	Physics	BS		2	0	0	0	0	20	30	2	50
TE7687	203	Physics Lab	BS		0	0	2	10	15	0	0	1	25
TE7288	204	Programming in C	ES		3	0	0	0	0	30	45	3	75
TE7289	205	Programming in C Lab	ES		0	0	2	10	15	0	0	1	25

Code	No	Course	Cat									Credits	Total
T7383	206	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	207	Communication skills lab	HS		0	0	2	10	15	0	0	1	25
T6873	208	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
TE7690	209	Statistics for Data Science	BS		3	1	0	0	0	40	60	4	90
TE7748	210	Software Tools for Artificial Intelligence and Machine Learning	BS		0	0	2	25	0	0	0	1	25
TE7188	211	Environmental Science *			0	0	0	0	0	0	0	Non Credit Courses	0
TH4095	212	Fitness for Life *			0	0	0	0	0	0	0	Non Credit Courses	0
				Total	**13**	**2**	**8**	**55**	**45**	**165**	**210**	**19**	**475**

Semester :3													
Generic Core Courses													
TE7699	301	Probability and Random Processes	BS		2	1	0	0	0	30	45	3	75
TE7544	302	Data Structures and Algorithms	PC		3	0	0	0	0	30	45	3	75
TE7546	303	Data Structures and Algorithms Lab	PC		0	0	4	20	30	0	0	2	50
TEE7034	304	Data Preprocessing and EDA Lab	PC		0	0	4	20	30	0	0	2	50
TEE7029	305	Database Concepts for Data Science	ES		2	0	0	0	0	20	30	2	50
TEE7030	306	Database Concepts for Data Science Lab	ES		0	0	4	20	30	0	0	2	50
T6749	307	Design Thinking	HS		2	0	0	0	0	50	0	2	50
F0003	308	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
F0001	309	Flexi-Credit Course	PC		0	0	2	25	0	0	0	1	25
				Total	**12**	**1**	**14**	**85**	**90**	**205**	**120**	**20**	**500**
Generic Elective Courses Group													

Code	No.	Course	Cat.										
T6872	310	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25
T6760	311	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

Code	No.	Course	Cat.										
T6774	401	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
F0003	402	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
F0001	403	Flexi-Credit Course	PC		0	0	2	25	0	0	0	1	25
TE7499	404	Supervised Machine Learning	PC		4	0	0	0	0	40	60	4	100
TE7500	405	Supervised Machine Learning Lab	PC		0	0	4	20	30	0	0	2	50
TE7760	406	Unsupervised Learning	PC		3	0	0	0	0	30	45	3	75
TE7761	407	Unsupervised Learning Lab	PC		0	0	2	10	15	0	0	1	25
TE7290	408	Project Based Learning-I	PIS		0	0	4	50	0	0	0	2	50
TE7542	409	Discrete Mathematics	BS		2	1	0	0	0	30	45	3	75
T4005	410	Integrated Disaster Management *	MC		0	0	0	0	0	0	0	Non Letter Grade	0
				Total	**14**	**1**	**12**	**105**	**45**	**225**	**150**	**21**	**525**

Generic Elective Courses Group

Code	No.	Course	Cat.										
T6184	411	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6186	412	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6188	413	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**

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total Marks
					L	T	Lab	Practical		Theory			
								CA	ESE	CA	ESE		
Semester :5
Generic Core Courses
T8000	501	Service Learning	HS		0	0	8	100	0	0	0	4	100
F0003	502	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
TE7753	503	Deep Learning	PC		3	0	0	0	0	30	45	3	75
TE7754	504	Deep Learning Lab	PC		0	0	2	10	15	0	0	1	25
P2935	505	Natural Language Processing	PC		3	0	0	0	0	30	45	3	75
P2929	506	Natural Language Processing Lab	PC		0	0	2	10	15	0	0	1	25
TE7663	507	Data Visualization Lab	PC		0	0	4	20	30	0	0	2	50
TE7483	508	Applications and use cases of Machine Learning	PC		0	0	4	20	30	0	0	2	50
TEE7033	509	AI Ethics	PC		1	0	0	0	0	25	0	1	25
P3184	510	Computer Networks	PC		3	0	0	0	0	30	45	3	75
				Total	13	0	20	160	90	190	135	23	575
Open Elective Courses Group
TE7677	511	Financial Mathematics	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7700	512	Smart Materials	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7223	513	Smart Urban Planning	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7240	514	Water Resource Planning and Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
T7499	515	Java	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7750	516	Web Application Development	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TEE7018	517	Engineering	OE	Electronics &	3	0	0	0	0	30	45	3	75

Code	Sr	Course Name	Type	Offered By	L	T	P						
		Simulation and Modeling Tools		Tele-communication Engineering									
TE7428	518	Introduction to Image Processing	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7810	519	Industrial Revolution and Introduction of Industry 5.0	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
T7650	520	Six sigma	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 : 6										
			Generic Core Courses										
TE7484	601	Computer Vision	PC		3	0	0	0	0	30	45	3	75
TE7485	602	Computer Vision Lab	PC		0	0	2	10	15	0	0	1	25
TE7565	603	Reinforcement Learning	PC		3	0	0	0	0	30	45	3	75
TE7496	604	Reinforcement Learning Lab	PC		0	0	2	10	15	0	0	1	25
T7802	605	Capstone Course	PC		2	0	0	0	0	50	0	2	50
TE7291	606	Project Based Learning-II	PIS		0	0	4	50	0	0	0	2	50
			Total		**8**	**0**	**8**	**70**	**30**	**110**	**90**	**12**	**300**
			Generic Elective Courses Group - I										
TE7490	607	Generative Adversarial Networks	PE		3	0	0	0	0	30	45	3	75
TE7261	608	Internet of Things	PE		3	0	0	0	0	30	45	3	75
TEE7031	609	Optimization Techniques for Machine Learning	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 - II										
TE7491	610	Generative Adversarial Networks Lab	PE		0	0	2	10	15	0	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 Marks
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7262	611	Internet of Things Lab	PE		0	0	2	10	15	0	0	1	25
TEE7032	612	Optimization Techniques for Machine Learning Lab	PE		0	0	2	10	15	0	0	1	25
		Total Required Credits			**0**	**0**	**2**	**10**	**15**	**0**	**0**	**1**	**25**
Generic Elective Courses Group - III													
TE7562	613	Speech Systems	PE		3	0	0	0	0	30	45	3	75
TE7943	614	Full Stack Development	PE		3	0	0	0	0	30	45	3	75
TE7536	615	Embedded AI	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 - IV													
TE7563	616	Speech Systems Lab	PE		0	0	2	10	15	0	0	1	25
TE7942	617	Full Stack Development Lab	PE		0	0	2	10	15	0	0	1	25
TE7535	618	Embedded AI Lab	PE		0	0	2	10	15	0	0	1	25
		Total Required Credits			**0**	**0**	**2**	**10**	**15**	**0**	**0**	**1**	**25**
Generic Elective Courses Group - V													
T2585	619	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50
TE7438	620	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	621	Nanotechnology	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7676	622	Executive Corporate Communication For Impact	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7195	623	GIS Applications	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7203	624	Intelligent Transportation Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75

Code	No	Course	Cat	Department									
TE7297	625	Software Testing Tools	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7756	626	Open Source Technologies	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
T7584	627	Printed Circuit Board (PCB) Design	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7334	628	Introduction to Mechatronics	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7804	629	Design Optimization Techniques	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7351	630	3D Printing and Prototyping	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
	New	Time Series Analysis	OE	AIML	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
TE7493	702	Multimodal AI	PC		3	0	0	0	0	30	45	3	75
TE7494	703	Multimodal AI Lab	PC		0	0	2	10	15	0	0	1	25
TE7552	704	Big Data Analytics	PC		3	0	0	0	0	30	45	3	75
TE7554	705	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											
TE7534	706	Healthcare informatics	PE		3	0	0	0	0	30	45	3	75
P2993	707	Graph Neural Networks	PE		3	0	0	0	0	30	45	3	75
TE7551	708	Block chain Technologies	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- II											
TE7564	709	AI in Wireless	PE		3	0	0	0	0	30	45	3	75

		Communications											
TE7497	710	Responsible AI	PE		3	0	0	0	0	30	45	3	75
TE7941	711	MLOps	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											
TE7561	712	AI in Wireless Communications Lab	PE		0	0	2	10	15	0	0	1	25
TE7498	713	Responsible AI Lab	PE		0	0	2	10	15	0	0	1	25
TE7940	714	MLOps Lab	PE		0	0	2	10	15	0	0	1	25
		Total Required Credits			**0**	**0**	**2**	**10**	**15**	**0**	**0**	**1**	**25**
		Generic Elective Courses Group- IV											
TE7560	715	Robotic Process Automation	PE		3	0	0	0	0	30	45	3	75
TE7532	716	Smart Society	PE		3	0	0	0	0	30	45	3	75
TE7533	717	AI for Banking and Finance	PE		3	0	0	0	0	30	45	3	75
		Total Required Credits			**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**

		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
					0	**0**	**28**	**140**	**210**	**0**	**0**	**14**	**350**
				Total									

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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Annexure A

SUMMARY

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	10	13	23	575
Semester 5	8	18	26	650
Semester 6	6	19	25	625
Semester 7	0	22	22	550
Semester 8	0	14	14	350
Total	**39**	**131**	**170**	**4250**