National Education Policy (NEP) Compliant Curriculum Structure for B. Tech (Artificial Intelligence and Machine Learning) (With effect from Academic Year 2025-26)

॥वसुधैव कुटुम्बकम्॥

Department of Artificial Intelligence and Machine Learning

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 (Artificial Intelligence and Machine Learning)
Programme Structure 2025-29

<table>
<tr><td>1.</td><td>OBJECTIVE</td><td colspan="4">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.</td></tr>
<tr><td>2.</td><td>DURATION (IN MONTHS)</td><td colspan="4">48 (Full Time)</td></tr>
<tr><td>3.</td><td>INTAKE</td><td colspan="4">30</td></tr>
<tr><td rowspan="4">4.</td><td rowspan="4">RESERVATION</td><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 colspan="2">a) Kashmiri Migrants (In Seats)</td><td colspan="2">b) International Students (In Percentage)</td></tr>
<tr><td colspan="2">2</td><td colspan="2">20</td></tr>
<tr><td>5.</td><td>ELIGIBILITY</td><td colspan="4">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 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 Passed B.Sc. Degree from a recognized University as defined by UGC, with atleast 45% marks (40% marks or equivalent grade for Scheduled Caste / Scheduled Tribes) and</td></tr>
</table>

		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 (Artificial Intelligence and Machine Learning)

10.	**FEE**		**Academic Fee p.a**	**Institute Deposit**	**Total**
	Indian Students (Amount in INR)		270000	20000	290000
	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	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	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	16	3	0	0	3	0		22
7(A)	15	7	0	0	0	0		22
7(B)	22	0	0	0	0	0		22
8	14	0	0	0	0	0		14
Total	**137**	**14**	**0**	**0**	**9**	**0**		**160**

Symbiosis Institute of Technology, Hyderabad
Bachelor of Technology (Artificial Intelligence and Machine Learning)
Programme Structure 2025-29

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													
		Linear Algebra	BS		2	1	0	0	0	45	30	3	75
		Chemistry	BS		2	0	0	0	0	30	20	2	50
		Chemistry Lab	BS		0	0	2	15	10	0	0	1	25
		Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	45	30	3	75
		Introduction to AI and Python Programming	ES		3	0	0	0	0	45	30	3	75
		Introduction to AI and Python Programming Lab	ES		0	0	2	15	10	0	0	1	25
		Introduction to Environment and Sustainability	ES		1	0	0	0	0	25	0	1	25
		Indian Knowledge Systems	IKS		2	0	0	0	0	50	0	2	50
		Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
		Critical Thinking	HS		1	0	0	0	0	25	0	1	25
		Tinker Lab	ES		0	0	4	50	0	0	0	2	50
				Total	**15**	**1**	**8**	**70**	**30**	**290**	**110**	**20**	**500**
Semester :2													
Generic Core Courses													
		Calculus	BS		2	1	0	0	0	45	30	3	75
		Physics for Computer Engineers	BS		3	0	0	0	0	45	30	3	75
		Technical Communication Skills	HS		0	0	2	25	0	0	0	1	25
		Programming in C	ES		3	0	0	0	0	45	30	3	75
		Digital Electronics and Logic Design	PC		2	1	0	0	0	45	30	3	75
		Programming in C Lab	ES		0	0	2	15	10	0	0	1	25
		Creative Thinking	HS		1	0	0	0	0	25	0	1	25
		Statistics for Data Science	BS		3	1	0	0	0	60	40	4	100
		Software Tools for Artificial Intelligence and Machine Learning	BS		0	0	2	25	0	0	0	1	25

		Health and Wellness - Module I			0	0	0	0	0	0	0	Non Credit Courses	0
		Career Essential - I*			0	0	0	0	0	0	0	Non Credit Courses	0
				Total	**15**	**2**	**6**	**65**	**10**	**265**	**160**	**20**	**500**
Semester :3													
Generic Core Courses													
		Probability and Random Processes	BS		2	1	0	0	0	45	30	3	75
		Data Structures and Algorithms	PC		3	0	0	0	0	45	30	3	75
		Data Structures and Algorithms Lab	PC		0	0	4	30	20	0	0	2	50
		Data Pre-processing and EDA Lab	PC		0	0	4	30	20	0	0	2	50
		Database Concepts for Data Science	ES		2	0	0	0	0	30	20	2	50
		Database Concepts for Data Science Lab	ES		0	0	4	30	20	0	0	2	50
		Design Thinking	HS		2	0	0	0	0	50	0	2	50
		Flexi Course	PC		0	0	4	50	0	0	0	2	50
		Cyber Security	PC		2	0	0	0	0	50	0	2	50
		Health and Wellness - Module II			0	0	0	0	0	0	0	Non Credit Courses	0
		Career Essential -II*			0	0	0	0	0	0	0	Non Credit Courses	0
				Total	**11**	**1**	**16**	**140**	**60**	**220**	**80**	**20**	**500**
Semester :4													
Generic Core Courses													
		Principles of Economics	HS		2	0	0	0	0	50	0	2	50
		Supervised Machine Learning	PC		4	0	0	0	0	60	40	4	100
		Supervised Machine Learning Lab	PC		0	0	4	30	20	0	0	2	50
		Unsupervised Learning	PC		3	0	0	0	0	45	30	3	75
		Unsupervised Learning Lab	PC		0	0	2	15	10	0	0	1	25
		Project Based Learning-I	PIS		0	0	4	50	0	0	0	2	50
		Operating Systems	PC		3	0	0	0	0	45	30	3	75
		Integrated Disaster Management *	MC		0	0	0	0	0	0	0	Non Letter Grade	0
		Career Essential -III*			0	0	0	0	0	0	0	Non Credit Courses	0
				Total	**11**	**1**	**10**	**95**	**30**	**200**	**100**	**17**	**425**

Open Elective Courses Group - I (Choose Any One Course)													
		Quantum Computing for Engineers	MOPE		2	1	0	0	0	45	30	3	75
		Mathematics for Data Science	MOPE		2	1	0	0	0	45	30	3	75
		AI System development	MOPE		2	1	0	0	0	45	30	3	75
		Smart Cities planning and management	MOPE		2	1	0	0	0	45	30	3	75
		Intelligent Waste Management Techniques	MOPE		2	1	0	0	0	45	30	3	75
		Web Technologies	MOPE		2	1	0	0	0	45	30	3	75
		Data Science	MOPE		2	1	0	0	0	45	30	3	75
		Engineering Simulation and Modelling Tools	MOPE		2	1	0	0	0	45	30	3	75
		Medical Electronics	MOPE		2	1	0	0	0	45	30	3	75
		3D Printing and Prototyping	MOPE		2	1	0	0	0	45	30	3	75
		Battery Management Systems	MOPE		2	1	0	0	0	45	30	3	75
		Fundamentals of Robotics and Automation	MOPE		2	1	0	0	0	45	30	3	75
		Robot Process Automation	MOPE		2	1	0	0	0	45	30	3	75
				Total				**0**	**0**	**45**	**30**	**3**	**75**
Semester :5													
Generic Core Courses													
		Service Learning	HS		0	0	4	50	0	0	0	2	50
		Deep Learning	PC		3	0	0	0	0	45	30	3	75
		Deep Learning Lab	PC		0	0	2	15	10	0	0	**1**	25
		Natural Language Processing	PC		3	0	0	0	0	45	30	3	75
		Natural Language Processing Lab	PC		0	0	2	15	10	0	0	1	25
		Data Visualization Lab	PC		0	0	4	30	20	0	0	2	50
		Applications and use cases of Machine Learning	PC		0	0	4	30	20	0	0	2	50
		AI Ethics	PC		1	0	0	0	0	25	0	1	25
		Vasudhaiva Kutumbakam			0	0	0	0	0	0	0	MC	Non Graded Course
		Career Essentials-IV*			0	0	0	0	0	0	0	MC	Non Graded Course
				Total	**7**	**0**	**16**	**140**	**60**	**115**	**60**	**15**	**375**
Generic Elective Courses Group - I (Choose Any One Course)													

		Cloud Computing Tools and Techniques	PE		3	0	2	25	0	75	0	4	100
		Advanced Computer Networks	PE		3	0	2	25	0	75	0	4	100
		Advances in Machine Learning	PE		3	0	2	25	0	75	0	4	100
		Data Warehousing and Mining	PE		3	0	2	25	0	75	0	4	100
		Essentials of Augmented and Virtual Reality	PE		3	0	2	25	0	75	0	4	100
		IoT Data Analytics	PE		3	0	2	25	0	75	0	4	100
				Total				**25**	**0**	**75**	**0**	**4**	**100**
Open Elective Courses Group – II (Choose Any One Course)													
		Financial Mathematics	OE	Applied Science	2	1	0	0	0	45	30	3	75
		Smart Materials	OE	Applied Science	2	1	0	0	0	45	30	3	75
		Smart Urban Planning	OE	Civil Engineering	2	1	0	0	0	45	30	3	75
		Water Resource Planning and Management	OE	Civil Engineering	2	1	0	0	0	45	30	3	75
		Java	OE	CSE	2	1	0	0	0	45	30	3	75
		Web Application Development	OE	CSE	2	1	0	0	0	45	30	3	75
		Introduction to Image Processing	OE	ECE	2	1	0	0	0	45	30	3	75
		Industrial Revolution and Introduction of Industry 5.0	OE	ME	2	1	0	0	0	45	30	3	75
		Six sigma	OE	ME	2	1	0	0	0	45	30	3	75
				Total				**0**	**0**	**45**	**30**	**3**	**75**
Semester : 6													
Generic Core Courses													
		Computer Vision	PC		3	0	0	0	0	45	30	3	75
		Computer Vision Lab	PC		0	0	2	15	10	0	0	1	25
		Reinforcement Learning	PC		3	0	0	0	0	45	30	3	75
		Reinforcement Learning Lab	PC		0	0	2	15	10	0	0	1	25
		Flexi Course	PC		2	0	1	25	0	50	0	3	75
		Project Based Learning- II	PIS		0	0	4	50	0	0	0	2	50
		Computer Networks	PC		3	0	0	0	0	45	30	3	75
		Career Essentials-V*			0	0	0	0	0	0	0	MC	Non Graded Course

				Total	**11**	**0**	**9**	**105**	**20**	**185**	**90**	**16**	**400**
Generic Elective Courses Group - II (Choose Any One Course)													
		Generative Adversarial Networks	PE		3	0	0	0	0	45	30	3	75
		Internet of Things	PE		3	0	0	0	0	45	30	3	75
		Optimization Techniques for Machine Learning	PE		3	0	0	0	0	45	30	3	75
		Speech Systems	PE		3	0	0	0	0	45	30	3	75
		Full Stack Development	PE		3	0	0	0	0	45	30	3	75
		Embedded AI	PE		3	0	0	0	0	45	30	3	75
				Total	**3**	**0**	**0**	**0**	**0**	**45**	**30**	**3**	**75**
Open Elective Courses Group - III (Choose Any One Course)													
		Nanotechnology	OE	Applied Science	3	0	0	0	0	45	30	3	75
		Executive Corporate Communication For Impact	OE	Applied Science	3	0	0	0	0	45	30	3	75
		GIS Applications	OE	Civil Engineering	3	0	0	0	0	45	30	3	75
		Intelligent Transportation Management	OE	Civil Engineering	3	0	0	0	0	45	30	3	75
		Software Testing Tools	OE	CSE	3	0	0	0	0	45	30	3	75
		Open Source Technologies	OE	CSE	3	0	0	0	0	45	30	3	75
		Printed Circuit Board (PCB) Design	OE	ECE	3	0	0	0	0	45	30	3	75
		Introduction to Mechatronics	OE	ECE	3	0	0	0	0	45	30	3	75
		Design Optimization Techniques	OE	ME	3	0	0	0	0	45	30	3	75
		3D Printing and Prototyping	OE	ME	3	0	0	0	0	45	30	3	75
		Bioinformatics	MOPE	Applied Science	2	1	0	0	0	45	30	3	75
		GenAI Tools and Techniques	MOPE	AIML	2	1	0	0	0	45	30	3	75
		Data Engineering	MOPE	AIML	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)/B Tech (Research)													
Generic Core Courses													
		B. Tech Project	PIS		0	0	8	60	40	0	0	4	100
		Flexi Course	PC		2	0	2	50	0	25	0	3	75
		Big Data Analytics	PC		3	0	0	0	0	45	30	3	75
		Big Data Analytics Lab	PC		0	0	2	15	10	0	0	1	25
		Project Management and Practices	PC		2	0	0	0	0	30	20	2	50

		Flexi Course (MOOC)	PE		0	0	0	0	0	50	0	2	50
				Total	**7**	**0**	**12**	**125**	**50**	**150**	**50**	**15**	**375**
Generic Elective Courses Group - III (Choose Any One Course)													
		Healthcare informatics	PE		3	0	0	0	0	45	30	3	75
		Graph Neural Networks	PE		3	0	0	0	0	45	30	3	75
		Block chain Technologies	PE		3	0	0	0	0	45	30	3	75
		Robotic Process Automation	PE		3	0	0	0	0	45	30	3	75
		Smart Society	PE		3	0	0	0	0	45	30	3	75
		AI for Banking and Finance	PE		3	0	0	0	0	45	30	3	75
				Total	**3**	**0**	**0**	**0**	**0**	**45**	**30**	**3**	**75**
Generic Elective Courses Group - IV (Choose Any One Course)													
		High Performance Computing	PE		3	0	2	25	0	75	0	4	100
		Digital Forensics	PE		3	0	2	25	0	75	0	4	100
		Soft Computing	PE		3	0	2	25	0	75	0	4	100
		Information Storage & Retrieval	PE		3	0	2	25	0	75	0	4	100
		Robotics and AI	PE		3	0	2	25	0	75	0	4	100
		IT Infrastructure and Automation	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**

Semester	Internal Credits	External Credits	Total Credits	Total Marks
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