INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI

M.Tech Curriculum: Data Science and Artificial Intelligence (DSAI)

From Academic Year 2025-26

Semester - I

S.No	Course Type	Course No	Course Name	L-T-P-C
1.	Core Basket[1]	CS519L or EE506L	Machine Learning or Pattern Recognition and Machine Learning	3-0-0-3
2.	Core	CS516L	Data Science and Engineering	3-0-0-3
3.	Core	CS519P	Intelligent Systems Laboratory	0-0-3-2
4.	Core	MA501L	Linear Algebra for Engineers	2-0-0-2
5.	Core	MA503L	Probability Theory for Engineers	2-0-0-2
6.	Bridge Elective[2]	CS503P	Advanced Data Structures and Algorithms Laboratory	0-0-3-2
7.	Professional Elective[3]		Professional Elective 1	X-X-X-3
			TOTAL	**15 /17[2]**

Semester – II

S.No	Course Type	Course No	Course Name	L-T-P-C
1.	Core	CS539L	Artificial Intelligence	3-0-0-3

[1] This is a core course to be taken from the provided basket

[2] This course will be mandatory for those students who require additional background on data structures and algorithms as determined by an internal exam and cut-off during the start of the program.

[3] This course can be from any department to provide fundamentals for choosing a specialized vertical related to DS and AI in subsequent semesters. It is mandatory for the department offering PE1 to have a relevant follow-up course.

[4] Any course offered by the CSE department is considered as department elective.

2.	Department Elective[4]		Department Elective	X-X-X-3
3.	Professional Elective		Professional Elective 2	X-X-X-3
4.	Professional Elective		Professional Elective 3	X-X-X-3
5.	Professional Elective		Professional Elective 4	X-X-X-3
6.	Free Elective		Free Elective 1	X-X-X-3
			TOTAL	**18**

Semester - III

S.No	Course Type	Course No	Course Name	L-T-P-C
1.			Project Phase I/Internship (Summer)	- - - 2
2.	Free Elective		Free Elective 2	X-X-X-3
3.			Project Phase II	- - - 9
			TOTAL	**14**

Semester - IV

S.No	Course Type	Course No	Course Name	L-T-P-C
1.			Project Phase III	- - - 15
			TOTAL	**15**

Total Credits - 62 (Max 64)

The following tables provide the professional elective basket options at this point in time.

Professional Electives 1 (CSE) (Semester – 1)

S.No	Course No	Course Name	L-T-P-C
1.	CS510L	Parallel Computing	3-0-0-3
2.	CS515L	Computational Methods in Optimization	3-0-0-3
3.	CS533L	Reinforcement Learning Algorithms	3-0-0-3

Professional Electives 2,3, and 4 (CSE) (Semester – 2)

S.No	Course No	Course Name	L-T-P-C
1.	CS518L	Deep Learning	3-0-0-3
2.	CS522L	Industrial Software Engineering	3-0-0-3
3.	CS523L	Distributed Systems	3-0-0-3
4.	CS534L	Foundations of Data Science	3-0-0-3
5.	CS512L	GPU Computing	3-0-0-3

Professional Electives 1 (EE) (Semester – 1)

S.No	Course No	Course Name	L-T-P-C
1.	EE527L	Advanced Signal Analysis and Processing	3-0-0-3
2.	EE523L	Wireless Communication	3-0-0-3
3	EE526L	Speech Signal Processing	3-0-0-3
4	EE507L	Computer Vision	3-0-0-3
5	EE516L	Medical Imaging	3-0-0-3

Professional Electives 2, 3, and 4 (EE) (Semester – 2)

S.No	Course No	Course Name	L-T-P-C
1.	EE567L	Machine Learning for Signal Inference	3-0-0-3
2.	EE565L	Machine Learning for Wireless Communication	3-0-0-3
3	EE532L	Deep Learning for Healthcare	3-0-0-3
4	EE555L	Deep Learning for Computer Vision	3-0-0-3
5	EE601L	Deep Learning: Theory and Applications	3-0-0-3

Professional Electives 1,2,3, and 4 (MA) (Semester – 1 & 2)

S.No	Course No	Course Name	L-T-P-C
1	MA504L	Statistical Methods for Engineers	3-0-0-3
2	MA508L	Statistical Inference	3-0-0-3
3	MA603L	Multivariate Statistical Analysis	3-0-0-3
4	MA606L	Bayesian Statistics	3-0-0-3
5	MA615L	Generalized Linear Models	3-0-0-3
6	MA617L	Categorical Data Analysis	3-0-0-3
7	MA619L	Functional Data Analysis	3-0-0-3
8	MA622L	Operations Research	3-0-0-3
9	MA624L	Spatio-Temporal Modeling	3-0-0-3
10	MA626L	Statistical Simulation and Data Analysis	3-0-0-3
11	MA628L	Statistical Analysis of Network	3-0-0-3
12	MA629L	Statistical Learning: Theory and Applications	3-0-0-3

Professional Electives 1 (CH) (Semester – 1)

S.No	Course No	Course Name	L-T-P-C
1	CH502L	Optimization Techniques	3-0-0-3
2	CH505L	Modern Process Control	3-0-0-3
3	CH513L	Chemical Reactor Analysis and Design	3-0-0-3
4	CH512L	Introduction to Molecular Dynamics Simulations	3-0-0-3
5	CH514L	Mathematical Methods for Chemical Engineers	3-0-0-3
6	CH511L	Biological Fluid Mechanics	3-0-0-3

Professional Electives 2, 3, and 4 (CH) (Semester – 2)

S.No	Course No	Course Name	L-T-P-C
1	CH502L	Optimization Techniques	3-0-0-3
2	CH514L	Mathematical Methods for Chemical Engineers	3-0-0-3
3	CH524L	Machine Learning in Process Engineering	3-0-0-3
4	CH527L	Reinforcement Learning in Process Engineering	3-0-0-3
5	CH525L	Optimization for Machine Learning	3-0-0-3
6	CH528L	Applied Time-Series Analysis	3-1-0-4
7	CH523L	Chemical Production Scheduling	3-0-0-3
8	CH517L	Transport Processes	3-0-0-3
9	CH515L	Molecular Thermodynamics	3-0-0-3