



COIMBATORE INSTITUTE OF TECHNOLOGY, COIMBATORE – 641 014
(Autonomous Institution affiliated to ANNA UNIVERSITY, CHENNAI)
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE REGULATIONS
2023 - CHOICE BASED CREDIT SYSTEM

B. TECH. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

CURRICULA AND SYLLABI

SEMESTER I

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	23FYH111	Technical English	HSC	2	2	0	4	4
2.	23FYM115	Matrices and Vector Calculus	BSC	3	1	0	4	4
3.	23FYP117	Engineering Physics	BSC	3	0	0	3	3
4.	23FYC115	Applied Chemistry – 1	BSC	3	0	0	3	3
5.	23AD111	Problem Solving Using C Programming	ESC	3	0	0	3	3
PRACTICALS								
1.	23FPC122	Basic Sciences Laboratory	BSC	0	0	4	4	2
2.	23AD121	Engineering Graphics	BSC	0	0	4	4	2
3.	23AD122	C Programming Laboratory	ESC	0	0	2	2	1
MANDATORY COURSES								
1.	23MC101	Induction Programme	MC	-	-	-	15 Days	-
2.	23FYH121	Heritage of Tamils	OEC	1	-	-	1	1
3.	23MC102	Soft Skills	MC	-	-	-	1	-
TOTAL				15	3	10	29	23

SEMESTER II

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	23FYM217	Linear Algebra and Gradient Calculus	BSC	3	1	0	4	4
2.	23AD211	Fundamentals of Industry Revolution 4.0	PCC	2	0	2	4	3
3.	23AD212	Principles of Computer Systems	PCC	3	0	0	3	3
4.	23AD213	Digital Logic Design	ESC	3	0	0	3	3
5.	23AD214	Programming with Python	ESC	3	0	0	3	3
PRACTICALS								
1.	23FYP221	English Communication and Competency Laboratory	HSC	0	0	4	4	2
2.	23AD221	Digital Logic Design Laboratory	PCC	0	0	2	2	1
3.	23AD222	Python Programming Laboratory	ESC	0	0	4	4	2
MANDATORY COURSES								
1.	23CC	Co -Curricular Activities*	OEC				1	1
2.	23CC221	NSS						
3.	23CC222	YRC						
4.	23CC223	RSP						
5.	23CC224	Sports						
6.	23FYP221	Environmental Science and Engineering	OEC				1	1
7.	23FYP222	Tamils and Technology	OEC				1	1
TOTAL				14	1	12	30	24

SEMESTER III

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	23M318	Probability and Applied Statistics	BSC	3	1	0	4	4
2.	23AD311	Data Structures and Algorithms	PCC	3	1	0	4	4
3.	23AD312	Artificial Intelligence	PCC	3	0	0	3	3
4.	23AD313	Software Engineering Principles and Practices	PCC	3	0	0	3	3
5.	23AD314	Database Management Systems	PCC	3	0	0	3	3
PRACTICALS								
1.	23AD321	Data Structures and Algorithms Laboratory	PCC	0	0	4	4	2
2.	23AD322	Database Management Systems Laboratory	PCC	0	0	4	4	2
3.	23AD323	Object Oriented Programming in Java	PCC	0	0	2	2	1
MANDATORY COURSES								
1.	23MC301	Induction Programme	MC	-	-	-	7 Days	-
2.	23MC321	Human Values and Professional Ethics	MC	1	-	-	1	1
3.	23MC322	Design thinking	MC	-	-	-	1	1
TOTAL				16	2	10	29	24

SEMESTER IV

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	23M413	Discrete Mathematics and Automata Theory	BSC	3	1	0	4	4
2.	23AD411	Machine Learning Techniques	PCC	3	0	0	3	3
3.	23AD412	Web Development Technologies	PCC	3	0	0	3	3
4.	23AD413	Data Communication and Networking	PCC	3	0	0	3	3
5.	23AD414	Foundation in Data Science	PCC	3	0	0	3	3
PRACTICALS								
1.	23AD421	Machine Learning Laboratory	PCC	0	0	4	4	2
2.	23AD422	Web Development Laboratory	PCC	0	0	4	4	2
3.	23AD423	Statistical Programming for Data Science	PCC	0	0	2	2	1
MANDATORY COURSES								
1.		Value Added Course – I	EEC	-	-	-	1	1
2.	23MC401	Community Services and Engineering	MC	-	-	-	1	-
TOTAL				15	1	10	28	22

SEMESTER V

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	23AD511	Cloud Architecture	PCC	3	0	0	3	3
2.	23AD512	Mobile Application Development	PCC	3	0	0	3	3
3.	23AD513	Data Mining and Analysis	PCC	3	0	0	3	3
4.		Elective I	PEC	3	0	0	3	3
5.		Elective II	PEC	3	0	0	3	3
PRACTICALS								
1.	23AD521	Mobile Application Development Laboratory	PCC	0	0	4	4	2
2.	23AD522	Data Mining and Analysis Laboratory	PCC	0	0	4	4	2
3.	23AD523	Tensor Flow Laboratory	PCC	0	0	4	4	2
4.	23AD541	Inplant Training	EEC	2 Weeks				1
MANDATORY COURSES								
1.	23MC501	Seminar and Technical Writing	EEC	-	-	-	1	1
2.		Valued Added Course - II	EEC	-	-	-	1	1
TOTAL				15	3	10	29	24

SEMESTER VI

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	23AD611	Deep Learning Techniques	PCC	3	0	0	3	3
2.	23AD612	Computer Vision and Pattern Recognition	PCC	3	0	0	3	3
3.	23AD613	Data Visualization	PCC	3	0	0	3	3
4.		Elective III	PEC	3	0	0	3	3
5.		Elective IV	PEC	3	0	0	3	3
PRACTICALS								
1.	23AD621	Deep Learning Laboratory	PCC	0	0	4	4	2
2.	23AD622	Data Visualization Laboratory	PCC	0	0	4	4	2
3.	23AD623	Computer Vision Laboratory	PCC	0	0	2	2	1
4.	23AD641	Mini Project	EEC	0	0	4	4	2
MANDATORY COURSES								
1.	23MC601	Hackathon	EEC	-	-	-	1	1
TOTAL				15	0	14	30	23

SEMESTER VII

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	23AD711	Data Security	PCC	3	0	0	3	3
2.	23AD712	Internet of Things	PCC	3	0	0	3	3
3.	23AD713	Natural Language Processing	PCC	3	0	0	3	3
4.		Elective V	PEC	3	0	0	3	3
5.		Elective VI	PEC	3	0	0	3	3
PRACTICALS								
1.	23AD721	Internet of Things Laboratory	PCC	0	0	4	4	2
2.	23AD722	Natural Language Processing Laboratory	PCC	0	0	4	4	2
3.	23AD723	Big Data Tools and Techniques Laboratory	PCC	0	0	4	4	2
TOTAL				15	0	10	27	21

SEMESTER VIII

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
		Elective VII	PEC/OEC	3	0	0	3	3
		Elective VIII	PEC/OEC	3	0	0	3	3
PRACTICALS								
	23AD841	Project Work and Viva - Voce	EEC	0	0	12	12	6
TOTAL				6	0	12	18	12

LIST OF PROFESSIONAL ELECTIVE COURSES:

SI. No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	CREDITS
1.	23ADPE01	User Interface Design	PEC	3	0	0	45	3
2.	23ADPE02	Design and Analysis of Algorithms	PEC	3	0	0	45	3
3.	23ADPE03	Information Retrieval	PEC	3	0	0	45	3
4.	23ADPE04	Generative AI	PEC	3	0	0	45	3
5.	23ADPE05	Agile Software Development	PEC	3	0	0	45	3
6.	23ADPE06	Optimization Techniques	PEC	3	0	0	45	3
7.	23ADPE07	Graph Theory in Data Science	PEC	3	0	0	45	3
8.	23ADPE08	Virtual Reality	PEC	3	0	0	45	3
9.	23ADPE09	Regression Analysis	PEC	3	0	0	45	3
10.	23ADPE10	Software Testing	PEC	3	0	0	45	3
11.	23ADPE11	Reinforcement Learning	PEC	3	0	0	45	3
12.	23ADPE12	Fundamentals of Blockchain	PEC	3	0	0	45	3
13.	23ADPE13	Evolutionary Algorithms	PEC	3	0	0	45	3
14.	23ADPE14	Digital Forensics	PEC	3	0	0	45	3
15.	23ADPE15	Distributed Systems	PEC	3	0	0	45	3
16.	23ADPE16	Cyber-Physical Systems	PEC	3	0	0	45	3
17.	23ADPE17	Social Media Analytics	PEC	3	0	0	45	3
18.	23ADPE18	DevOps	PEC	3	0	0	45	3
19.	23ADPE19	Mining Large Datasets	PEC	3	0	0	45	3
20.	23ADPE20	Information Theory and Coding	PEC	3	0	0	45	3
21.	23ADPE21	AI in healthcare	PEC	3	0	0	45	3
22.	23ADPE22	Financial AI	PEC	3	0	0	45	3

23.	23ADPE23	Intelligent Systems	PEC	3	0	0	45	3
24.	23ADPE24	Fog Computing	PEC	3	0	0	45	3
25.	23ADPE25	Business Analytics	PEC	3	0	0	45	3
26.	23ADPE26	Speech Recognition	PEC	3	0	0	45	3
27.	23ADPE27	Neural Networks in Cognitive Science	PEC	3	0	0	45	3
28.	23ADPE28	Game theory in AI	PEC	3	0	0	45	3
29.	23ADPE29	GPU computing	PEC	3	0	0	45	3
30.	23ADPE30	Ethical Hacking	PEC	3	0	0	45	3
31.	23ADPE31	Applied Chemistry – II	PEC	3	0	0	45	3
32.	23ADPE32	Prompt Engineering	PEC	3	0	0	45	3
33.	23ADPE33	Large Language Models	PEC	3	0	0	45	3
34.	23ADPE34	Responsible AI	PEC	3	0	0	45	3
35.	23ADPE35	Retrieval-Augmented Generation	PEC	3	0	0	45	3

LIST OF OPEN ELECTIVE COURSES OFFERED FOR THE STUDENTS OF OTHER UG PROGRAMMES:

Sl. No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C	UG PROGRAMME
1.	23ADOE01	AI Essentials	OEC	3	0	0	45	3	ALL
2.	23ADOE02	Introduction to Cloud and Virtualization	OEC	3	0	0	45	3	ALL
3.	23ADOE03	Data analysis using open-source tools	OEC	3	0	0	45	3	ALL
4.	23ADOE04	Python for Machine Learning and Deep Learning	OEC	3	0	0	45	3	ALL
5.	23ADOE05	Data Visualization using Power BI	OEC	3	0	0	45	3	ALL

SUMMARY

Category; BSC – Basic sciences, HSC– Humanities and Social Sciences, ESC–Engineering sciences, PCC –Professional Core, PEC- Professional Elective, OEC-Open Elective Course, EEC –Employability Enhancement Course, MC – Mandatory Course

B.TECH (HONS) AI AND DS MAJOR**VERTICAL 1: ROBOTICS**

SI. No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	23ADV101	Principles of Robotics	PEC	3	0	0	45	3
2.	23ADV102	Mechanics of Robotics	PEC	3	0	0	45	3
3.	23ADV103	Control of Robotic Systems	PEC	3	0	0	45	3
4.	23ADV104	Machine Learning for Robotics	PEC	3	0	0	45	3
5.	23ADV105	Robot Operating Systems	PEC	3	0	0	45	3
6.	23ADV106	Autonomous Systems	PEC	3	0	0	45	3

VERTICAL 2: MACHINE LEARNING AND ANALYTICS

SI. No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	23ADPE02	Design and Analysis of Algorithms	PEC	3	0	0	45	3
2.	23ADPE07	Graph Theory in Data Science	PEC	3	0	0	45	3
3.	23ADPE11	Reinforcement Learning	PEC	3	0	0	45	3
4.	23ADPE17	Social Media Analytics	PEC	3	0	0	45	3
5.	23ADPE25	Business Analytics	PEC	3	0	0	45	3
6.	23ADPE27	Neural Networks in Cognitive Science	PEC	3	0	0	45	3

VERTICAL 3: SOFTWARE DEVELOPMENT PRACTICES

SI. No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	23ADPE05	Agile Software Development	PEC	3	0	0	45	3
2.	23ADPE10	Software Testing	PEC	3	0	0	45	3
3.	23ADPE15	Distributed Systems	PEC	3	0	0	45	3
4.	23ADPE18	DevOps	PEC	3	0	0	45	3
5.	23ADPE23	Intelligent Systems	PEC	3	0	0	45	3
6.	23ADPE26	Speech Recognition	PEC	3	0	0	45	3

VERTICAL 4: SMART DIGITAL TECHNOLOGIES

SI. No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	23ADPE04	Generative AI	PEC	3	0	0	45	3
2.	23ADPE08	Virtual Reality`	PEC	3	0	0	45	3
3.	23ADPE12	Fundamentals of Blockchain	PEC	3	0	0	45	3
4.	23ADPE16	Cyber-Physical Systems	PEC	3	0	0	45	3
5.	23ADPE24	Fog Computing	PEC	3	0	0	45	3
6.	23ADPE29	GPU Computing	PEC	3	0	0	45	3

MINOR : ARTIFICIAL INTELLIGENCE

SI. No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	23ADVM101	Basics of Artificial Intelligence	OEC	3	0	0	45	3
2.	23ADVM102	Machine Learning Concepts and Applications	OEC	3	0	0	45	3
3.	23ADVM103	Deep Learning	OEC	3	0	0	45	3
4.	23ADVM104	Statistics for Business Data Analytics	OEC	3	0	0	45	3
5.	23ADVM105	Big Data Management for Engineers	OEC	3	0	0	45	3
6.	23ADVM106	Building AI Products	OEC	3	0	0	45	3

LIST OF VALUE-ADDED COURSES OFFERED BY THE DEPARTMENT

SI. No	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CONTACT PERIODS	C
1.	23ADOC01	Full Stack Web Development	EEC	-	-	-	15	-
2.	23ADOC02	Edge IoT and its Applications	EEC	-	-	-	15	-
3.	23ADOC03	Deep Learning with TensorFlow	EEC	-	-	-	15	-
4.	23ADOC04	Building Cloud Solutions using AWS	EEC	-	-	-	15	-
5.	23ADOC05	Foundations in Natural Language Processing	EEC	-	-	-	15	-