



**PERIYAR MANIAMMAI INSTITUTE OF  
SCIENCE & TECHNOLOGY**

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**Faculty of Computing Science and Applications (FCSA)  
DEPARTMENT OF INFORMATICS**

**B.Sc. DATA SCIENCE  
Curriculum - Regulations 2024**

Category of courses and minimum credit requirement as per the new guidelines of UGC for B.Sc. Data Science programme are outlined below:

Sl. No.	Category of Courses	Credits	
		UG 3-Years	UG 4-Years
1.	Major (Core)	60	80
2.	Minor Stream	24	32
3.	Multidisciplinary	09	09
4.	Ability Enhancement Courses	08	08
5.	Skill Enhancement Courses	09	09
6.	Value Added Courses	06 - 08	06 - 08
7.	Internship	02 - 04	02 - 04
8.	Research Project / Dissertation	-	12
Total Credits		120	160

**SEMESTER I**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory Courses</b>						
1	U24TA101	பொதுத்தமிழ் (General Tamil)	3	0	0	3
	U24TA102	அடிப்படைத் தமிழ் (Foundational Tamil)				
2	U24EN102	English for Communication - I	3	0	0	3
3	U24MA101	Matrices and Differential Calculus	3	1	0	4
4	U24CO101	Information Technology Essentials	3	1	0	4
5	U24PH103	Physical Science (Multidisciplinary - I)	3	0	0	3
6	U24EM101	Coding Techniques	3	0	0	3
<b>Practical Courses</b>						
7	U24EM102	Coding Techniques Laboratory	0	0	2	1
8	U24EM103	Speech Communication	0	0	2	1
Total			18	2	4	22

**SEMESTER II**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory Courses</b>						
1	U24TA151	அறிவியல் தமிழ் (Scientific Tamil)	3	0	0	3
	U24TA152	வளர்தமிழ் (Beginners Tamil)				
2	U24EN152	English for Communication - II	3	0	0	3
3	U24MA152	Vector Calculus	3	1	0	4
4	U24CO151	Scripting Paradigms	3	1	0	4
5	U24EM151	Programming in Practice	3	0	0	3
6	U24VA002	Universal Human Values	2	1	0	3
<b>Practical Courses</b>						
7	U24CO152	Scripting Paradigms Laboratory	0	0	2	1
8	U24EM152	Programming in Practice Laboratory	0	0	2	1
Total			17	3	4	22

**SEMESTER III**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory Courses</b>						
1	U24TA201	கணினித்தமிழ் (Computing Tamil)	3	0	0	3
2	U24EN201	English for Communication - III	3	0	0	3
3	U24MA201	Multivariate Calculus and Linear Algebra	3	1	0	4
4	U24DS201	Data Structures and Algorithms	3	0	0	3
5	U24DS202	Database Management Systems	3	0	0	3
6	U24DS203	Data Science Fundamentals	3	0	0	3
7	U24VA001	Environmental Studies	2	0	0	2
<b>Practical Courses</b>						
8	U24DS204	Data Structures and Algorithms Laboratory	0	0	2	1
9	U24DS205	Database Management Systems Laboratory	0	0	2	1
Total			20	1	4	23

**SEMESTER IV**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory Courses</b>						
1	U24TA251	தொழில்நுட்பத் தமிழ் (Technical Tamil)	3	0	0	3
2	U24EN251	English for Communication - IV	3	0	0	3
3	U24MA255	Mathematical Concepts of Data Analytics	3	0	0	3
4	U24DS251	Data Warehousing and Mining	3	0	0	3
5	U24DS252	Fundamentals of Artificial Intelligence	3	0	0	3
6	U24XXXXX	Multidisciplinary - II	3	0	0	3
7	U24DS7XX	Indian Knowledge Systems (IKS)	3	0	0	3
<b>Practical Courses</b>						
8	U24DS253	Data Mining with R Programming Laboratory	0	0	4	2
9	U24EM256	Internship	0	0	4	2
Total			21	0	8	25

**SEMESTER V**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory Courses</b>						
1	U24DS301	Machine Learning	3	0	0	3
2	U24DS302	Neural Networks	3	0	0	3
3	U24DS303	Interactive Data Visualization	3	0	0	3
4	U24DS304	Operating Systems	3	1	0	4
5	U24DS7XX	Open Elective (Multidisciplinary - III)	3	0	0	3
6	U24DS9XX	Programme Elective - I	3	0	0	3
7	U24EM301	Community Engagement and Social Responsibility	1	0	2	2
<b>Practical Courses</b>						
8	U24DS305	Machine Learning Laboratory	0	0	2	1
9	U24DS306	Data Visualization Laboratory	0	0	2	1
<b>Audit Course</b>						
10	U24AUXXX	Audit Course - I	--	--	--	--
Total			19	1	6	23

**SEMESTER VI**

<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Credits</b>			
			<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Theory Courses</b>						
1	U24DS351	Big Data Analytics	3	0	0	3
2	U24DS352	Deep Learning	3	0	0	3
3	U24DS353	Business Intelligence Fundamentals	3	0	0	3
4	U24DS354	Cloud Computing and Virtualization	3	1	0	4
5	U24DS8XX	Online Course	3	0	0	3
6	U24DS9XX	Programme Elective - II	3	0	0	3
<b>Practical Courses</b>						
7	U24DS355	Deep Learning Laboratory	0	0	4	2
8	U24DS356	Capstone Project	0	0	8	4
<b>Audit Course</b>						
9	U24AUXXX	Audit Course - II	--	--	--	--
<b>Total</b>			<b>18</b>	<b>1</b>	<b>12</b>	<b>25</b>

## SEMESTER VII

### B.Sc. (Honours) Data Science

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory Integrated with Practical Courses</b>						
1	U24DS401	Data Modelling and Programming	3	0	2	4
2	U24DS402	Generative AI Models	3	0	2	4
3	U24DS403	DevOps	3	0	2	4
4	U24DS404	Forecasting Methods and Applications	3	0	2	4
5	U24DS405	Mobile Applications Development	3	0	2	4
Total			15	0	10	20

## SEMESTER VIII

### B.Sc. (Honours) Data Science

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory Integrated with Practical Courses</b>						
1	U24DS451	Applied Predictive Analytics	3	0	2	4
2	U24DS452	AutoML and MLOps	3	0	2	4
<b>Project</b>						
3	U24DS453	Project / Dissertation	0	0	24	12
Total			6	0	28	20

## SEMESTER VII

### B.Sc. (Honours with Research) Data Science

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory Integrated with Practical Courses</b>						
1	U24DS401	Data Modelling and Programming	3	0	2	4
2	U24DS402	Generative AI Models	3	0	2	4
3	U24DS404	Forecasting Methods and Applications	3	0	2	4
<b>Theory Courses</b>						
4	U24DS406	IPR and Research Methodology	3	1	0	4
<b>Research Project</b>						
5	U24DS407	Applicative Research	0	0	8	4
Total			12	1	14	20

## SEMESTER VIII

### B.Sc. (Honours with Research) Data Science

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Research Project</b>						
1	U24DS454	Research / Dissertation (with SCOPUS / SCI Publication)	0	0	40	20
Total			0	0	40	20

Actual Credit allotment for the course categories as per the UGC / TANSICHE guidelines for the B.Sc. Data Science programme is given below:

Sl. No.	Category of Courses	Credits		
		3 Years	4 Years (Honours)	4 Years (Honours with Research)
1	Major (Core)	60	80	72
2	Minor Stream	26	34	34
3	Multidisciplinary	09	09	09
4	Ability Enhancement Courses	24	24	24
5	Skill Enhancement Courses	09	09	09
6	Value Added Courses	08	08	08
7	Internship	04	04	04
8	Research Project / Dissertation	-	12	20
Total		140	180	180

**Semester wise Credit Distribution (In all Categories of Courses)**

**B.Sc. Data Science - 3 Years**

<b>Sl. No.</b>	<b>Category of Courses</b>	<b>Credits</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>
1	Major (Core)	60	4	4	15	11	11	15
2	Minor Stream	26	4	5	-	-	7	10
3	Multidisciplinary	09	3	-	-	3	3	-
4	Ability Enhancement Courses	24	6	6	6	6	-	-
5	Skill Enhancement Courses	09	5	4	-	-	-	-
6	Value Added Courses	08	-	3	2	3	-	-
7	Internship	04	-	-	-	2	2	-
8	Project / Dissertation	-	-	-	-	-	-	-
<b>Total Credits</b>		<b>140</b>	<b>22</b>	<b>22</b>	<b>23</b>	<b>25</b>	<b>23</b>	<b>25</b>

**Semester wise Credit Distribution (In all Categories of Courses)**

**B.Sc. (Honours) Data Science - 4 Years**

<b>Sl. No.</b>	<b>Category of Courses</b>	<b>Credits</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>
1	Major (Core)	82	4	4	15	11	11	15	12	8
2	Minor Stream	32	4	5	-	-	7	10	8	-
3	Multidisciplinary	09	3	-	-	3	3	-	-	-
4	Ability Enhancement Courses	24	6	6	6	6	-	-	-	-
5	Skill Enhancement Courses	09	5	4	-	-	-	-	-	-
6	Value Added Courses	08	-	3	2	3	-	-	-	-
7	Internship	04	-	-	-	2	2	-	-	-
8	Project / Dissertation	12	-	-	-	-	-	-	-	12
<b>Total Credits</b>		<b>180</b>	<b>22</b>	<b>22</b>	<b>23</b>	<b>25</b>	<b>23</b>	<b>25</b>	<b>20</b>	<b>20</b>

**Semester wise Credit Distribution (In all Categories of Courses)**

**B.Sc. Data Science (Honours with Research) - 4 Years**

<b>Sl. No.</b>	<b>Category of Courses</b>	<b>Credits</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>
1	Major (Core)	74	4	4	15	11	11	15	12	-
2	Minor Stream	32	4	5	-	-	7	10	8	-
3	Multidisciplinary	9	3	-	-	3	3	-	-	-
4	Ability Enhancement Courses	24	6	6	6	6	-	-	-	-
5	Skill Enhancement Courses	9	5	4	-	-	-	-	-	-
6	Value Added Courses	8	-	3	2	3	-	-	-	-
7	Internship	4	-	-	-	2	2	-	-	-
8	Project / Dissertation	20	-	-	-	-	-	-	-	20
<b>Total Credits</b>		<b>180</b>	<b>22</b>	<b>22</b>	<b>23</b>	<b>25</b>	<b>23</b>	<b>25</b>	<b>20</b>	<b>20</b>

The number of credits in each semester is summarized as follows:

<b>Programme</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>
B.Sc. Data Science	22	22	23	25	23	25	20	20

### Suggested List of Courses for Programme Elective - I

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24DS901	Internet of Things	3	0	0	3
2	U24DS902	Robotics and Intelligent Systems	3	0	0	3
3	U24DS903	Natural Language Processing	3	0	0	3
4	U24DS904	Computer Vision	3	0	0	3

### Suggested List of Courses for Programme Elective - II

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24DS951	Healthcare Data Analytics	3	0	0	3
2	U24DS952	Web Analytics	3	0	0	3
3	U24DS953	Social Media Analytics	3	0	0	3
4	U24DS954	Text Analytics	3	0	0	3

### Suggested List of Courses on Indian Knowledge Systems

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24DS751	Computing in Thirukkural	3	0	0	3
2	U24DS752	Ancient Indian Innovations in Computer Technology	3	0	0	3
3	U24DS753	Indian Knowledge System - Concepts and Applications	3	0	0	3
4	U24DS754	Scientific Thoughts of Periyar EVR	3	0	0	3

## List of Courses under Each Category

### Major (Core) Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24MA101	Matrices and Differential Calculus	3	1	0	4
2	U24MA152	Vector Calculus	3	1	0	4
3	U24MA201	Multivariate Calculus and Linear Algebra	3	1	0	4
4	U24DS201	Data Structures and Algorithms	3	0	0	3
5	U24DS202	Database Management Systems	3	0	0	3
6	U24DS203	Data Science Fundamentals	3	0	0	3
7	U24DS204	Data Structures and Algorithms Laboratory	0	0	2	1
8	U24DS205	Database Management Systems Laboratory	0	0	2	1
9	U24MA255	Mathematical Concepts of Data Analytics	3	0	0	3
10	U24DS251	Data Warehousing and Mining	3	0	0	3
11	U24DS252	Fundamentals of Artificial Intelligence	3	0	0	3
12	U24DS253	Data Mining with R Programming Laboratory	0	0	4	2
13	U24DS301	Machine Learning Fundamentals	3	0	0	3
14	U24DS302	Neural Networks	3	0	0	3
15	U24DS303	Interactive Data Visualization	3	0	0	3
16	U24DS305	Machine Learning Laboratory	0	0	2	1
17	U24DS306	Data Visualization Laboratory	0	0	2	1
18	U24DS351	Big Data Analytics	3	0	0	3
19	U24DS352	Deep Learning Fundamentals	3	0	0	3
20	U24DS353	Business Intelligence Fundamentals	3	0	0	3

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
21	U24DS355	Deep Learning Laboratory	0	0	4	2
22	U24DS356	Capstone Project	0	0	8	4
Total			45	3	24	60
<b>Additional Major (Core) Courses for 4 years B.Sc. (Honours)</b>						
23	U24DS401	Data Modelling and Programming	3	0	2	4
24	U24DS402	Generative AI Models	3	0	2	4
25	U24DS404	Forecasting Methods and Applications	3	0	2	4
26	U24DS451	Applied Predictive Analytics	3	0	2	4
27	U24DS452	AutoML and MLOps	3	0	2	4
Total			15	0	10	20
<b>Additional Major (Core) Courses for 4 years B.Sc. (Honours with Research)</b>						
23	U24DS401	Data Modelling and Programming	3	0	2	4
24	U24DS402	Generative AI Models	3	0	2	4
25	U24DS407	Applicative Research	0	0	8	4
Total			6	0	12	12

**Minor (Core) Courses**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24CO101	Information Technology Essentials	3	1	0	4
2	U24CO151	Scripting Paradigms	3	1	0	4
3	U24CO152	Scripting Paradigms Laboratory	0	0	2	1
4	U24DS304	Operating Systems	3	1	0	4
5	U24DS9XX	Programme Elective - I	3	0	0	3
6	U24DS354	Cloud Computing and Virtualization	3	1	0	4
7	U24DS8XX	Online Course	3	0	0	3
8	U24DS9XX	Programme Elective - II	3	0	0	3
Total			21	4	2	26
<b>Additional Minor (Core) Courses for 4 years B.Sc. (Honours) Data Science</b>						
9	U24DS403	DevOps	3	0	2	4
10	U24DS405	Mobile Applications Development	3	0	2	4
Total			6	0	4	8
<b>Additional Minor (Core) Courses for 4 years B.Sc. (Honours with Research) Data Science</b>						
9	U24DS404	Forecasting Methods and Applications	3	0	2	4
10	U24DS406	IPR and Research Methodology	3	1	0	4
Total			6	1	2	8

### Multidisciplinary Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24PH103	Physical Sciences	3	0	0	3
2	U24BC254	Financial Analysis and Reporting	3	0	0	3
3	U24DS254	Affective Computing	3	0	0	3
4	U24DS7XX	Open Elective	3	0	0	3
Total			9	0	0	9

### Ability Enhancement Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24TA101	பொதுத்தமிழ் (General Tamil)	3	0	0	3
	U24TA102	அடிப்படைத் தமிழ் (Foundational Tamil)				
2	U24EN102	English for Communication - I	3	0	0	3
3	U24TA151	அறிவியல் தமிழ் (Scientific Tamil)	3	0	0	3
	U24TA152	வளர்தமிழ் (Beginners Tamil)				
4	U24EN152	English for Communication - II	3	0	0	3
5	U24TA201	கணினித்தமிழ் (Computing Tamil)	3	0	0	3
6	U24EN201	English for Communication - III	3	0	0	3
7	U24TA251	தொழில்நுட்பத் தமிழ் (Technical Tamil)	3	0	0	3
8	U24EN251	English for Communication - IV	3	0	0	3
Total			24	0	0	24

### Skill Enhancement Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EM101	Coding Techniques	3	0	0	3
2	U24EM102	Coding Techniques Laboratory	0	0	2	1
3	U24EM103	Speech Communication	0	0	2	1
4	U24EM151	Programming in Practice	3	0	0	3
5	U24EM152	Programming in Practice Laboratory	0	0	2	1
Total			6	0	6	9

### Value Added Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24VA002	Universal Human Values	2	1	0	3
2	U24VA001	Environmental Studies	2	0	0	2
3	U24DS7XX	Indian Knowledge Systems (IKS)	3	0	0	3
Total			7	1	0	8

### Internship

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EM256	Internship	0	0	0	2
2	U24EM301	Community Engagement and Social Responsibility	0	0	4	2
Total			0	0	4	4

**Research Project / Dissertation (Honours)**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24DS453	Project / Dissertation	0	0	24	12
Total			0	0	24	12

**Research Project / Dissertation (Honours with Research)**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24DS454	Research / Dissertation (with SCOPUS / SCI Publication)	0	0	40	20
Total			0	0	40	20

**Audit Courses**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24AU001	Disaster Management	--	--	--	--
2	U24AU003	Cyber Security	--	--	--	--
3	U24AU008	Entrepreneurship Development	--	--	--	--
4	U24AU009	Constitution of India	--	--	--	--
Total			--	--	--	--