

# **LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (LOCF)**

**B.Sc. Data Science  
(I to VI Semester)**

**for 2024-25 admitted Students**

**DEPARTMENT OF COMPUTER TECHNOLOGY AND  
DATA SCIENCE**



**SRI KRISHNA ARTS AND SCIENCE COLLEGE**  
**COIMBATORE – 641008**  
**DEPARTMENT OF COMPUTER TECHNOLOGY AND DATA**  
**SCIENCE**  
**(2024-2025)**

**I. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**

Graduates from the B.Sc. Data Science Programme are expected to achieve the following PEOs

<b>PEO 1</b>	Prepare industry relevant quality graduates with programming and critical AEC skills to serve the domestic and global community.
<b>PEO 2</b>	Disseminate the conceptual knowledge in the concerned discipline for societal development and transformation.
<b>PEO 3</b>	Develop as a capable technical industry leader with outstanding communication skills.
<b>PEO 4</b>	Become technically competent in the field of computer science with a passion for lifelong learning.

**II. PROGRAMME LEARNING OUTCOMES (PLOs)**

The Graduates of B.Sc. Data Science programme will be able to:

<b>PLO1</b>	<b>Knowledge:(Cognitive)</b> Identify the programming and technical knowledge acquired in the current computational demands.
<b>PLO2</b>	<b>Critical Thinking Skills:(Cognitive)</b> Analyze the complex problems and identify solutions through critical thinking Skills.
<b>PLO3</b>	<b>Practical Skills:(Psychomotor)</b> Adapt to the latest tools and techniques used to develop domain based innovative solutions with the acquired technical and operational skills.
<b>PLO4</b>	<b>Teamwork Skills:(Affective)</b> Function and contribute as a team in the diversified environment in taking competitive decision.
<b>PLO5</b>	<b>Communication Skills:(Affective)</b> Communicate effectively with the computing community as well as society to comprehend effective documentation and presentation.
<b>PLO6</b>	<b>Digital Skills:(Affective)</b> Incorporate advanced digital skills in designing, developing, managing and deploying in media and technical field.
<b>PLO7</b>	<b>Numeracy Skills:(Cognitive)</b> Apply quantitative, numerical and statistical skills to solve challenging problems with effective solutions.

<b>PLO8</b>	<b>Leadership Skills:(Affective)</b> Articulate leadership skills in motivating the team towards the target in a multi-disciplinary environment.
<b>PLO9</b>	<b>Lifelong Learning Skills:(Affective)</b> Recognize the need and ability to involve independent and life-long learning in the changing era of technology.
<b>PLO10</b>	<b>Entrepreneurial Skills:(Affective)</b> Interpret the impact of professional business solutions on business environment for sustainable development.
<b>PLO11</b>	<b>Ethics &amp; Professional Skills:(Affective)</b> Follow ethical principles and commit to professional responsibilities for a relevant technical practice.

III. PROGRAMME LEARNING OUTCOMES VS GRADUATE ATTRIBUTES VS TAXONOMY OF VERBS														
PLO	Graduate Attributes										Blooms			
	Knowledge	Critical Thinking	Practical Skills	Team work	Communication skills	Digital skills	Numeracy	Leadership skills	Lifelong learning	Entrepreneurial skills	Ethics & Professionalism	Cognitive	Psychomotor	Affective
1	√											√		
2		√										√		
3			√										√	
4				√										√
5					√									√
6						√								√
7							√					√		
8								√						√
9									√					√
10										√				√
11											√			√

	PEO 1	PEO 2	PEO 3
PLO 1	√		
PLO 2	√		
PLO 3		√	
PLO 4			√
PLO 5			√
PLO 6		√	
PLO 7		√	
PLO 8			√
PLO 9			
PLO 10			

PLO 11

√

**IV. ADDITIONAL PROGRAMME OUTCOMES (APOs)**

<b>APO 1</b>	The students will have an ability to be socially intelligent with intelligent quotient and emotional quotient.
<b>APO 2</b>	They will be having virtual collaborating ability.
<b>APO 3</b>	They will have the ability to use the social media effectively for productive use.
<b>APO 4</b>	They will have critical thinking and innovative skills.
<b>APO 5</b>	They will be provided with good digital footprint.

**V. PROGRAMME SPECIFIC OUTCOMES (PSO's)**

<b>PSO 1</b>	Ability to understand the programming concepts, methodologies and algorithm to solve computational problems.
<b>PSO 2</b>	Ability to apply emerging software development techniques and tools in providing real-time solutions.

**VI. Mapping of PEOs with PSOs**

	<b>PSO 1</b>	<b>PSO 2</b>
<b>PEO 1</b>	√	
<b>PEO 2</b>		√
<b>PEO 3</b>	√	
<b>PEO 4</b>		√

VIII. Curriculum Structure for **B.Sc. Data Science**

## Course Components, Credits &amp; Marks Distribution

Part No	Group	Basic Structure: Distribution of Courses	Number of Courses	Total Marks	Total Credits
I - IV	1	AEC – Ability Enhancement Courses	10	1000	24
III& IV	2	DSC – Discipline Specific Courses	20	1500	65
	3	DSE – Discipline Specific Electives	11	1000	35
	4	GEC – Generic Elective Courses	4	400	12
	5	SEC – Skill Enhancement Courses	2	100	4
IV	6	ANCC I & II – Audit Non-Credit Courses	2	Completed	
V		ANCC III – Audit Non-Credit Courses	1		
-	7	Drive Through Courses (DTCs) – (SWAYAM-NPTEL, Coursera, any courses certified by statutory bodies, etc.)	Any number	-	Additional Credits
<b>Total</b>				<b>4000</b>	<b>140</b>

**Group 1. Ability Enhancement Courses (AECs)(10 Courses)– Part (I–IV)**

AEC are the courses based upon the content that leads to knowledge enhancement. Ability Enhancement Courses

(AEC) are the following:

S. No.	Course Code	Course Title	Semester	Ownership Department	Contact Hours	Marks	Credits
1	24AEC02/ 24AEC07/ 24AEC11/	<b>AEC Part I:</b> Language – I: Tamil-I – Tamil Nila - I/ Hindi – I/ French – I	I	Language	5	100	3
2	24AEC22	<b>AEC Part II:</b> English-I: English Language Dynamics	I	English	5	100	3
3	24AEC33	<b>AEC Part III:</b> Academic Skills for Computer Studies	I	CS Stream	2	100	2

4	24AEC04/ 24AEC08/ 24AEC12	<b>AEC Part I:</b> Language – II: Tamil - II – Tamil Nila - II/ Hindi – II/ French – II	II	Language	5	100	3
5	24AEC24	<b>AEC Part II:</b> English – II: Campus to Corporate	II	English	5	100	3
6	24AEC43	<b>AEC Part III:</b> Comprehensive Project for Computer Studies	III	CS Stream	-	100	4
7	24AEC83	<b>AEC Part IV:</b> Communication Enhancement Course: Communication Excellence	III	English	2	100	1
8	24AEC81/ 24AEC82	<b>AEC Part IV:</b> Spoken Hindi/ Spoken Tamil	IV	Language	2	100	1
9	24AEC71	<b>AEC Part III:</b> Artificial Intelligence	V	CS Stream	5	100	3
10	24AEC51	<b>AEC Part III:</b> Cyber Ethics	VI	CS Streams	2	100	1
<b>Total</b>						<b>1000</b>	<b>24</b>

### Group 2. Discipline Specific Courses (DSCs)(20 Courses) – Part III

These courses are to be studied compulsorily by the students as a core requirement. The students are required to take DSCs across six semesters. The courses designed under this category aim to cover the basics that a student is expected to imbibe in the particular discipline. It includes major project.

S.No	Course Code	Course Title	Semester	Contact Hours	Marks	Credits
1.	24CSS01	<b>DSC 1:</b> Digital Computer Fundamentals	I	4	100	3
2.	24DSU01 /24AIU01	<b>DSC 2:</b> C++ Programming	I	5	50	4
3.	24DSU02 / 24AIU02	<b>DSC 3:</b> Practical: C++ Programming	I	2	50	2
4.	24CSS04	<b>DSC 4:</b> Data Structures and Algorithms	II	5	100	4
5.	24DSU03/ 24AIU03	<b>DSC 5:</b> Java Programming	II	5	50	4
6.	24DSU04/ 24AIU04	<b>DSC 6: Practical:</b> Java Programming	II	3	50	3

7.	24CSS07	<b>DSC 7:</b> Operating System	III	4	100	4
8.	24DSU05/ 24AIU05	<b>DSC 8:</b> Python Programming	III	4	100	4
9.	24DSU06/ 24AIU06	<b>DSC 9:</b> Practical: Python Programming	III	3	50	3
10.	24CSS10	<b>DSC 10:</b> Software Engineering	III	4	50	3
11.	24CSS11	<b>DSC 11:</b> Practical: Software Testing using Selenium	III	3	50	2
12.	24CSS12	<b>DSC 12:</b> Computer Networks	IV	5	100	4
13.	24CSS13	<b>DSC 13:</b> Relational Database Management Systems	IV	5	100	4
14.	24CSS14	<b>DSC 14:</b> Practical: SQL and PL/SQL	IV	3	100	3
15.	24CSS15	<b>DSC 15:</b> Machine Learning using Python	V	5	100	4
16.	24CSS16	<b>DSC 16:</b> Practical: Machine Learning using Python	V	4	50	3
17.	24CSS17	<b>DSC 17:</b> Major Project	VI	5	100	4
18.	24DSU07 / 24AIU07	<b>DSC 18:</b> Data Analytics using PySpark	VI	5	100	4
19.	24DSU08 / 24AIU08	<b>DSC 19:</b> Practical: Data Analytics using PySpark	VI	3	50	2
20.	24CSS20	<b>DSC 20:</b> Developing Thinking Skills	VI	2	50	1
<b>Total</b>					<b>1500</b>	<b>65</b>

### Project Work

During the Sixth semester each student should undertake a project work and submit the report. A guide will be allotted to each student by the Department. A student can select any research topic in discussion with the guide. The project report shall be subject to internal evaluation followed by a Viva-Voce. The project should be demonstrated at the time of examination.

#### **Internal Evaluation:**

Reviews (3)	– 60 Marks
Report	– 20 Marks
Attendance	– 20 Marks
Total	– 100 Marks will be converted to 40 (Internal) Marks

**End Semester Viva-Voce** will be conducted for 60 Marks.

(Dissertation - 40 Marks & Viva-voce - 20 Marks)

### Group 3. Discipline Specific Elective (DSEs) (11 Courses) – Part III

Discipline Specific Elective courses offered under the main discipline of study which may be specialized or advanced or supportive to the discipline of study. Students can choose any one course from two courses each in the list of following DSEs.

S. No.	Course Code	Course Title	Ownership Department	Contact Hours	Marks	Credits
1	24DSU09	<b>DSE 1:</b> Practical: Business Analytics using Excel	CT & DS Dept	-	100	2
2	24DSU10	<b>DSE 2:</b> Big Data Analytics	CT & DS Dept	5	100	4
	24DSU11	<b>DSE 2:</b> Data Wrangling				
3	24CSS22	<b>DSE 3:</b> VB .NET	CS Stream	4	100	3
	24CSS23	<b>DSE 3:</b> UI/UX Design				
	24DSU12	<b>DSE 3:</b> Data Visualization				
4	24CSS25	<b>DSE 4:</b> Practical: VB .NET	CS Stream	3	100	2
	24CSS26	<b>DSE 4:</b> Practical: UI/UX Design				
	24DSU13	<b>DSE 4:</b> Practical: Data Visualization	CT & DS Dept	3	100	2
5	24CSS28	<b>DSE 5:</b> Industrial Exposure Training	CS Stream	4 Weeks	100	4
6	24CSS29	<b>DSE 6:</b> Ethical Hacking	CS/ IT/CA Dept.	5	100	4
	24CSS30	<b>DSE 6:</b> Web Intelligence				
	24DSU14/ 24AIU14	<b>DSE 6:</b> Time Series Analysis	Maths Dept			
7	24CSS32	<b>DSE 7:</b> Practical: Ethical Hacking	CS/ IT/CA Dept.	3	50	2
	24CSS33	<b>DSE 7:</b> Practical: Web Intelligence				
	24DSU15 / 24AIU15	<b>DSE 7:</b> Practical: Scientific Programming using R	Maths Dept			
8	24DSU16	<b>DSE 8:</b> Data Mining	CT & DS Dept	5	100	4



	24DSU17	<b>DSE 8:</b> Reinforcement Learning	CT & DS Dept	5	100	4
9	24CSS35	<b>DSE 9:</b> Mobile Application Development	CT/CS/CA Dept	5	100	4
	24CSS36	<b>DSE 9:</b> Linux Programming				
	24CSS37	<b>DSE 9:</b> Visualization Analysis and Design				
	24DSU18	<b>DSE 9:</b> Next Generation Databases - No SQL	CT & DS Dept			
10	24CSS38	<b>DSE 10:</b> Practical: Mobile Application Development	CT/CS/CA Dept	3	50	2
	24CSS39	<b>DSE 10:</b> Practical: Linux Programming				
	24CSS40	<b>DSE 10:</b> Practical: Data Visualization Techniques				
	24DSU19	<b>DSE 10:</b> Practical: Next Generation Databases - No SQL	CT & DS Dept			
11	24CSS41	<b>DSE 11:</b> Internet of Things	CS Stream	5	100	4
	24CSS42	<b>DSE 11:</b> Cryptography and Network Security				
	24CSS43	<b>DSE 11:</b> Cloud Computing				
<b>Total</b>					<b>1000</b>	<b>35</b>

### Industrial Exposure Training (IET)

Students can opt for Industrial Exposure Training during fifth semester for a period of 4 weeks.

The Continuous Internal Assessment mark distribution for IET is as follows:

Component	Mode of Conduct	Project Coverage	Marks
3 Reviews	Presentation	Phase by Phase	60
Work Diary	Written	Phase by Phase	20
Report	Submission	Entire Process	20
<b>Total</b>			<b>100*</b>

\*100 Marks will be converted to 40 (Internal) Marks

The end semester examination of the Industrial Exposure Training will be given based on the report and

viva-voce for 60 marks, conducted by the Department.

Report: 40 Marks

Viva-voce: 20 Marks

**Group 4. Generic Elective Courses (GECs)(4 Courses)– Part III**

Generic Elective Courses are interdisciplinary in nature. They are additional courses based on expertise, specialization, requirements, scope, and need of the department.

Sl. No.	Course Code	Course Title	Semester	Ownership Department	Contact Hours	Marks	Credits
1	24GEU10	<b>GEC 1:</b> Statistics for Machine Learning	I	Maths Dept	5	100	3
2	24GEU11	<b>GEC 2:</b> Linear Algebra for Machine Learning	II	Maths Dept	5	100	3
3	24GEU12	<b>GEC 3:</b> Statistics for Data Science	III	Maths Dept	5	100	3
4	24GEU47	<b>GEC 4:</b> Embedded Systems	IV	ECS Dept	5	100	3
	24GEU48	<b>GEC 4:</b> Robotics and Applications					
	24GEU49	<b>GEC 4:</b> PC Hardware					
<b>Total</b>						<b>400</b>	<b>12</b>

**Group 5. Skill Enhancement Courses (SECs)(2 Courses)**

SEC I: Compulsory Course: Talent Enhancement Course: Career Guidance

SEC II: A Bucket of Skill based Courses are offered for the Under Graduate programmes by the departments aimed at imparting skill. A Student has to subscribe one course from list offered by the department.

S.No	Course Code	Course Title	Ownership Department
1.	24SEC01B	SEC 1 : Arithmetical Ability	Mathematics
2.	24SEC02	Search Engine Optimization	CS
3.	24SEC03	Practical: Modeling data Using Tableau	CT & DS
4.	24SEC04	Practical: Data Visualization Using Tableau	IT&CG
5.	24SEC05	Full Stack Web	CA

	Development	
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**Group 6. Audit Non-Credit Courses (ANCC)–Part IV & V**

Non-Credit Courses are intended for students who want to gain general knowledge, learn a new skill, upgrade existing skills, enrich their understanding of a wide range of topics, or develop personal interests. A student has to complete any two courses during Semester I and II.

Part IV- ANCC			
S. No.	Course Code	Course Title	Ownership Department
ANCC 1 (Semester I)			
1	24ANC01	Environmental Studies	Bioscience
ANCC 2 - Values & Ethics (Semester II)			
2	24ANC02	Human Rights	Social Work
3	24ANC03	Women’s Rights	Social Work
4	24ANC04	Yoga for Human Excellence	Psychology
5	24ANC05	Indian Culture and Heritage	English
6	24ANC06	Introduction to Cyber Security	CS
7	24ANC07	Consumer Protection	Commerce
8	24ANC08	Constitution of India	Commerce
9	24ANC09	Waste Management	Bioscience
10	24ANC10	Sustainable Development Goals	Management

Student has to take part in any one extension activity during their course of study.

Part V- ANCC		
ANCC 3 - Extension Activities		
S. No.	Course Code	Course Name
1	24ANC11	National Service Scheme
2	24ANC12	National Cadet Corps
3	24ANC13	Youth Red Cross
4	24ANC14	Red Ribbon Club
5	24ANC15	Rotaract Club
6	24ANC16	Sports
7	24ANC17	Association Activities
8	24ANC18	Club Activities

**Group 7.**

**i) Drive-Through Courses (DTCs) I & II – Additional Credits**

These courses are intended to bring out and promote the self-learning initiative of the students – where their own motivation is what drives them to complete the course and not external compulsions. This fosters the habit of keeping oneself updated always by means of self-study. It gives opportunities to the students to explore new areas of interest and earn additional credits. Students can take any number of courses under this cafeteria system. The credits will not be taken for CGPA calculation. Additional 4/3/2 credits per course will be given on submission of certificate.

1. Coursera
2. NPTEL
3. Any courses certified by statutory bodies.

**ii) Drive-Through Course (DTC – III)**

**Internship Training/Mini Project/ Spoken Tutorial/etc.**

The students have to complete one spoken tutorial course or any certification course suggested by the department.

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**VIII. Semester-wise Scheme**

**Semester I**

Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/R/N/G
24AEC02/ 24AEC07/ 24AEC11/	<b>AEC 1:</b> Language – I: Tamil-I – Tamil Nila - I/ Hindi – I/ French – I	T	5	3	25	75	100	3	SD	L/ N/ G/
24AEC22	<b>AEC 2:</b> English-I: English Language Dynamics	T	5	3	25	75	100	3	SD	G
24AEC33	<b>AEC 3:</b> Academic Skills for Computer Studies	T	2	3	100	-	100	2	SD	G
24CSS01	<b>DSC 1:</b> Digital Computer Fundamentals	T	4	3	25	75	100	3	SD	G
24DSU01/ 24AIU01	<b>DSC 2:</b> C++ Programming	T	5	3	10	40	50	4	SD / EM	G
24DSU02 / 24AIU02	<b>DSC 3:</b> Practical: C++ Programming	P	2	3	20	30	50	2	SD / EM	G
24GEU14/ 24GEU08/ 24GEU10	<b>GEC 1:</b> Mathematical Foundation for Computer Science / Discrete Mathematics / Statistics for Machine Learning	T	5	3	25	75	100	3	EM	G
24ANC01	<b>ANCC1 (NF2F)</b> Environmental Studies	T	2	-	-	-	Completed		SD	G
Drive Through Course I: Additional Credit Courses							Additional Credits			
<b>Total</b>			<b>30</b>				<b>600</b>	<b>20</b>		
<b>Semester II</b>										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/R/N/G

24AEC04/ 24AEC08/ 24AEC12/	<b>AEC 4:</b> Language – II Tamil – II- Tamil Nila - II/ Hindi – II/ French – II/	T	5	3	25	75	100	3	SD	L/ N/ G/ R/ N
24AEC24	<b>AEC 5:</b> English – II: Campus to Corporate	T	5	3	25	75	100	3	SD	G
24CSS04	<b>DSC 4:</b> Data Structures and Algorithms	T	5	3	25	75	100	4	SD / EM	G
24DSU03/ 24AIU03	<b>DSC 5:</b> Java Programming	T	5	3	10	40	50	4	SD / EM	G
24DSU04/ 24AIU04	<b>DSC 6:</b> Practical: Java Programming	P	3	3	20	30	50	3	SD / EM	G
24DSU09	<b>DSE 1:</b> Self Study: Practical: Business Analytics using Excel	P	-	-	-	100	100	2	SD	G
24GEU15/ 24GEU11	<b>GEC2:</b> Numerical Methods and Statistics/ Linear Algebra for Machine Learning	T	5	3	25	75	100	3	EM	G
24ANC02/ 24ANC03/ 24ANC04/ 24ANC05/ 24ANC06/ 24ANC07/ 24ANC08/ 24ANC09/ 24ANC10	<b>ANCC2 (NF2F)</b> Human Rights/ Women’s Rights/ Yoga for Human Excellence/ Indian Culture and Heritage/ Introduction to Cyber Security/ Consumer Protection/ Constitution of India/ Waste Management/ Sustainable Development Goals	T	2	-	-	-	Completed		SD	G
Drive Through Course II: Additional Credit Courses							Additional Credits			
<b>Total</b>			<b>30</b>				<b>600</b>	<b>22</b>		
<b>Semester III</b>										

Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/R/N/G
24AEC43	<b>AEC 6:</b> Comprehensive Project for Computer Studies	P	-	3	100	-	100	4	EN	G
24AEC83	<b>AEC 7: Part IV:</b> Communication Enhancement Course: Communication Excellence	T	2	2	100	-	100	1	SD	G
24CSS07	<b>DSC 7:</b> Operating System	T	4	3	25	75	100	4	SD	G
24DSU05/ 24AIU05	<b>DSC 8:</b> Python Programming	T	4	3	25	75	100	4	SD/EM	G
24DSU06/ 24AIU06	<b>DSC 9:</b> Practical: Python Programming	P	3	3	20	30	50	3	SD/EM	G
24CSS10	<b>DSC 10:</b> Software Engineering	T	4	3	10	40	50	3	SD/EM	G
24CSS11	<b>DSC 11:</b> Practical: Software Testing Using Selenium	P	3	3	20	30	50	2	SD/EM	G
24DSU10/ 24DSU11	<b>DSE 2:</b> Big Data Analytics / Data Wrangling	T	5	3	25	75	100	4	SD/EM/EN	G
24GEU16/ 24GEU13/ 24GEU12	<b>GEC 3:</b> Operations Research for Computer studies/ Applied Mathematics/ Statistics for Data Science	T	5	3	25	75	100	3	SD/EM	G
<b>Total</b>			<b>30</b>				<b>750</b>	<b>28</b>		
<b>Semester IV</b>										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/R/N/G
24AEC81/ 24AEC82	<b>AEC 8:</b> Spoken Hindi/ Spoken Tamil	T	2	2	100	-	100	1	SD	L/R/N/G

24CSS12	<b>DSC 12:</b> Computer Networks	T	5	3	25	75	100	4	SD/ EM	G
24CSS13	<b>DSC 13:</b> Relational Database Management Systems	T	5	3	25	75	100	4	SD	G
24CSS14	<b>DSC 14:</b> Practical: SQL and PL/SQL	P	3	3	40	60	100	3	SD	G
24CSS22/ 24CSS23/ 24DSU12	<b>DSE 3:</b> VB .NET/ UI/UX Design / Data Visualization	T	4	3	25	75	100	3	EN/ EM	G
24CSS25/ 24CSS26/ 24DSU13	<b>DSE 4:</b> Practical: VB .NET/ Practical: UI/UX Design / Practical: Data Visualization	P	3	3	40	60	100	2	EN/ EM	G
24GEU47/ 24GEU48/ 24GEU49	<b>GEC 4:</b> Embedded Systems/ Robotics and Applications/ PC Hardware	T	5	3	25	75	100	3	EM	G
24SEC01B	<b>SEC 1:</b> Arithmetical Ability	T	3	3	50	-	50	2	SD	G
<b>Total</b>			<b>30</b>				<b>750</b>	<b>22</b>		
<b>Semester V</b>										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/R/N/G
24CSS28	<b>DSE 5:</b> Industrial Exposure Training	-	4 Weeks	-	40	60	100	4	EM	G
24AEC71	<b>AEC 9:</b> Artificial Intelligence	T	5	3	25	75	100	3	SD/ E/ M	G
24CSS15	<b>DSC 13:</b> Machine Learning using Python	T	5	3	25	75	100	4	SD/E/ M	G
24CSS16	<b>DSC 14:</b> Practical: Machine Learning using Python	P	4	3	20	30	50	3	SD/E/ M	G



24CSS29/ 24CSS30/ 24DSU14/ 24AIU14	<b>DSE 6:</b> Ethical Hacking/ Web Intelligence/ Time Series Analysis	T	5	3	25	75	100	4	EN	G
24CSS32/ 24CSS33/ 24DSU15/ 24AIU15	<b>DSE 7:</b> Practical: Ethical Hacking / Practical: Web Intelligence/ Practical: Scientific Programming using R	P	3	3	20	30	50	2	EN	G
24DSU16/ 24DSU17	<b>DSE 8:</b> Data Mining/ Reinforcement Learning	T	5	3	25	75	100	4	SD /E M	G
24SEC03	<b>SEC 2: Practical:</b> Modeling data Using Tableau	P	3	3	20	30	50	2	SD/E M	G
Drive Through Course III – Internship Training /Mini Project/Spoken Tutorial							Completed			
<b>Total</b>			<b>30</b>				<b>650</b>	<b>26</b>		
<b>Semester VI</b>										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/R/N/G
24AEC51	<b>AEC 10:</b> Cyber Ethics	T	2	2	25	75	100	1	SD	G
24CSS17	<b>DSC 17:</b> Major Project	-	5	-	40	60	100	4	EN	G
24DSU07/ 24AIU07	<b>DSC 18:</b> Data Analytics using PySpark	T	5	3	25	75	100	4	EN	G
24DSU08/ 24AIU08	<b>DSC 19:</b> Practical: Data Analytics using PySpark	P	3	3	20	30	50	2	EN	G
24CSS20	<b>DSE 20:</b> Developing Thinking Skills	T	2	3	10	40	50	1	SD	G
24CSS35/ 24CSS36/ 24DSU18	<b>DSE 9:</b> Mobile Application Development / Linux Programming/ Next Generation	T	5	3	25	75	100	4	EN	G

	Databases - No SQL										
24CSS38/ 24CSS39/ 24DSU19	<b>DSE 10:</b> Practical: Mobile Application Development/ Practical: Linux Programming/ Practical: Next Generation Databases - No SQL	P	3	3	20	30	50	2	EN	G	
24CSS41/ 24CSS42/ 24CSS43	<b>DSE 11:</b> Internet of Things/ Cryptography and Network Security/ Cloud Computing	T	5	3	25	75	100	4	SD/EM	G	
24ANC11/ 24ANC12/ 24ANC13/ 24ANC14/ 24ANC15/ 24ANC16/ 24ANC17/ 24ANC18	<b>ANCC 3</b> Extension Activities National Service Scheme/ National Cadet Corps/ Youth Red Cross/ Red Ribbon Club/ Rotaract Club/ Sports/ Association Activities/ Club Activities	-	-	-	-	-	Grade	-	SD	G	
<b>Total</b>			<b>30</b>				<b>650</b>	<b>22</b>			
<b>Total</b>							<b>4000</b>	<b>140</b>			
<b>Drive-Through Courses (DTCs):</b> Courses offered in Coursera OR NPTEL OR Any courses certified by statutory bodies.		Additional 4 credits per course will be given on submission of Certificate					During Semester I to Semester VI				

The courses focus on the following needs	
SD	Skill Development
EM	Employability
EN	Entrepreneurship
L	Local
R	Regional
N	National
G	Global

### Semester-wise Distribution of Marks and Credits

Semester	Total Marks	Total Credits
I	600	20
II	600	22
III	750	28
IV	750	22
V	650	26
VI	650	22
<b>Total</b>	<b>4000</b>	<b>140</b>

#### OFFERED BY

#### List of Courses Offered by Mathematics Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/EM/EN	L/R/N/G
I	24GEU10	<b>GEC 1:</b> Statistics for Machine Learning	DS	T	5	3	25	75	100	3	EM
I	24SEC01B	SEC 1 : Arithmetical Ability	DS	T	3	50	-	50	2	-	-
II	24GEU11	<b>GEC 2:</b> Linear Algebra for Machine Learning	DS	T	5	3	25	75	100	3	EM
III	24GEU12	<b>GEC 3:</b> Statistics for Data Science	DS	T	5	3	25	75	100	3	SD/EM

#### OFFERED BY

#### List of Courses Offered by ECS Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/EM/EN	L/R/N/G
IV	24GEU47	<b>GEC 4:</b> Embedded Systems	DS	T	5	3	25	75	100	3	EM
	24GEU48	<b>GEC 4:</b> Robotics and Applications									
	24GEU49	<b>GEC 4:</b> PC Hardware									