Total Credits CSE-DS
[REGULAR Students]

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme			Credits
				L	T	P	
Semester - I			Total Academic Engagement and Credits	13	1	12	20
Semester – II				13	1	12	20
Semester – III				11	5	10	21
Semester – IV				11	3	16	22
Semester – V				13	3	12	22
Semester – VI				12	4	14	23
Semester – VII				9	3	22	23
Semester – VIII				4	2	20	16
Total				**86**	**22**	**118**	**167**

Total Credits
[LATERAL ENTRY Students]

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme			Credits
				L	T	P	
Semester – III			Total Academic Engagement and Credits	11	5	10	21
Semester – IV				11	3	16	22
Semester – V				13	3	12	22
Semester – VI				12	4	14	23
Semester – VII				9	3	22	23
Semester – VIII				4	2	20	16
Total				**60**	**20**	**94**	**127**

COURSE DISTRIBUTION: SEMESTER WISE CSE-DS

Sr No	Type of Course	Abbreviations	No. of Courses/Semester								Total	
												Lateral Entry from SEM III onwards
			1	2	3	4	5	6	7	8	Regular	
1	(a) Basic Science Courses	BSC	2	2	1	1	-	-	-	-	8	2
	(b) Basic Science Laboratory Course		1	1	-	-	-	-	-	-		
2	(a) Engineering Science Courses	ESC	4	3	-	-	-	-	-	-	12	0
	(b) Engineering Science Laboratory Courses		3	2	-	-	-	-	-	-		
3	(a) Humanities and Social Sciences including Management Courses	HSMC	-	1	1	1	1	1	-	-	7	4
	(b) Humanities and Social Sciences including Management Laboratory Courses		1	1	-	-	-	-	-	-		
4	(a) Professional Core Courses	PCC	-	-	4	3	3	3	1	-	26	26
	(b) Professional Core Laboratory Courses	LC	-	-	2	4	3	2	1	-		
5	(c) Professional Elective Courses	PEC	-	-	-	-	1	1	2	2	9	9
	(d) Professional Elective Laboratory Courses	LC-PEC	-	-	-	-	-	-	2	1		
6	Inter-disciplinary Foundation Courses	IFC	-	-	-	1	1	-	-	-	2	2
7	Skill Based Courses	SBC	1	1	1	1	1	-	-	-	5	3
8	Liberal Learning Courses	LLC	-	1	-	1	-	1	-	-	3	2
9	Inter-disciplinary Open Courses	IOC	-	-	-	-	-	1	1	-	2	2
10	Project Work & Internship	PROJ	-	-	-	-	1	2	2	1	6	6
11	Mandatory Learning Courses	MLC	-	-	1	1	1	1	-	-	4	4
	Total		12	12	10	13	12	12	9	4	84	60

CREDIT DISTRIBUTION: SEMESTER WISE CSE-DS

Sr No	Type of Course	Abbreviations	No. of Credits/Semester								Total Credits	
			1	2	3	4	5	6	7	8	Regular	Lateral Entry from SEM III onwards
1	(a) Basic Science Courses	BSC	6	6	3	3	-	-	-	-	20	6
	(b) Basic Science Laboratory Course		1	1	-	-	-	-	-	-		
2	(a) Engineering Science Courses	ESC	8	6	-	-	-	-	-	-	19	0
	(b) Engineering Science Laboratory Courses		3	2	-	-	-	-	-	-		
3	(a) Humanities and Social Sciences including Management Courses	HSMC	-	2	1	1	2	2	-	-	10	6
	(b) Humanities and Social Sciences including Management Laboratory Courses		1	1	-	-	-	-	-	-		
4	(a) Professional Core Courses	PCC	-	-	12	9	9	9	3	-	57	57
	(b) Professional Core Laboratory Courses	LC	-	-	3	5	3	2	2	-		
5	(a) Professional Elective Courses	PEC	-	-	-	-	3	2	6	6	21	21
	(b) Professional Elective Laboratory Courses	LC-PEC	-	-	-	-	-	-	2	2		
6	Inter-disciplinary Foundation Courses	IFC	-	-	-	2	2	-	-	-	4	4
7	Skill Based Courses	SBC	1	1	2	1	1	-	-	-	6	4
8	Liberal Learning Courses	LLC	-	1	-	1	-	1	-	-	3	2
9	Inter-disciplinary Open Courses	IOC	-	-	-	-	-	3	3	-	6	6
10	Project Work & Internship	PROJ	-	-	-	-	2	4	7	8	21	21
11	Mandatory Learning Courses	MLC	-	-	-	-	-	-	-	-	-	-
	Total		20	20	21	22	22	23	23	16	167	127

CREDIT DISTRIBUTION: SEMESTER WISE

1 Lecture hour = 1 Credit   2 Lab Hours = 1 Credit   1 Tutorial Hour = 1 Credit

Course and Credit Distribution CSE-DS

Sr. No.	Type of Course	Abbreviation	REGULAR		LATERAL ENTRY From SEM III onwards	
			No. of Courses	Total credits	No. of Courses	Total credits
1.	(a) Basic Science Courses (b) Basic Science Laboratory Course	BSC	8	20	2	6
2.	(a) Engineering Science Courses (b) Engineering Science Laboratory Courses	ESC	12	19	0	0
3.	(a) Humanities and Social Sciences including Management Courses (b) Humanities and Social Sciences including Management Laboratory Courses	HSMC	7	10	4	6
4.	(a)Professional Core Courses	PCC	26	57	26	57
	(b)Professional Core Laboratory Courses	LC				
5.	(a)Professional Elective Courses	PEC	9	21	9	21
	(b)Professional Elective Laboratory Courses	LC-PEC				
6.	Inter-disciplinary Foundation Courses	IFC	2	4	2	4
7.	Skill Based Courses	SBC	5	6	3	4
8.	Liberal Learning Courses	LLC	3	3	2	2
9.	Inter-disciplinary Open Courses	IOC	2	6	2	6
10.	Project Work & Internship	PROJ	6	21	6	21
11.	Mandatory Learning Courses	MLC	4	-	4	-
	Total		84	167	60	127

Semester–I

S.No.	Course Type	Course Code	Course Title	L	T	P	Credits
1	BSC	MA01	Linear Algebra	2	1	-	3
2	BSC	PY01	Optics & Modern Physics	3	-	-	3
3	ESC	ME01	Engineering Graphics &Visualization	2	-	-	2
4	ESC	CE01	Basic Civil Engineering	2	-	-	2
5	ESC	EC01	Basic Electronics Engineering	2	-	-	2
6	ESC	CS01	Programming for Problem Solving	2	-	-	2
7	BSC	PY01(P)	Optics & Modern Physics Lab	-	-	2	1
8	ESC	ME01(P)	Engineering Graphics Lab	-	-	2	1
9	ESC	CE01(P)	Basic Civil Engineering Lab	-	-	2	1
10	ESC	CS01(P)	Programming for Problem Solving Lab	-	-	2	1
11	SBC	EC01(P)	Electronics and Computer Workshop	-	-	2	1
12	LLC	LLC01	Liberal Learning Course-I	Credits to be added in Second Semester			
13	HSMC	HS01	Design Thinking	-	-	2	1
						Total Credits	**20**

Note:
- **Liberal Learning Course-II, LLC-01 (Any One Course from NCC/NSO/NCA)**
    - **A. NCC**
    - **B. NSO**
        - ➢ Anyone Sports at State Level
    - **C. NCA**
        - ➢ Music
        - ➢ Dance
        - ➢ Photography
        - ➢ Cinematography
        - ➢ Interior Design
        - ➢ Podcasting
        - ➢ Theatre
        - ➢ Painting etc.

Semester-II

S.No.	Course Type	Course Code	Course Title	Hrs./ Week			Credits
				L	T	P	
1	BSC	MA02	Calculus	2	1	-	3
2	BSC	CH01	Applied Chemistry	3	-	-	3
3	ESC	ME02	Fundamentals of Mechanical Engineering	2	-	-	2
4	ESC	CE02	Engineering Mechanics	2	-	-	2
5	ESC	EE01	Basic Electrical Engineering	2	-	-	2
6	HSMC	HS02	Communicative English	2	-	-	2
7	BSC	CH01(P)	Applied Chemistry Lab	-	-	2	1
8	ESC	CE02(P)	Engineering Mechanics Lab	-	-	2	1
9	ESC	EE01(P)	Basic Electrical Engineering Lab	-	-	2	1
10	HSMC	HS02(P)	Language Lab	-	-	2	1
11	LLC	LLC01	Liberal Learning Course-I	-	-	2	1
12	SBC	ME01(P)	Tech. Shop Lab	-	-	2	1
						Total Credits	**20**

Note:

- **Liberal Learning Course-II, LLC-01 (Any One Course from NCC/NSO/NCA)**
  - **D. NCC**
  - **E. NSO**
    - ➢ Anyone Sports at State Level
  - **F. NCA**
    - ➢ Music
    - ➢ Dance
    - ➢ Photography
    - ➢ Cinematography
    - ➢ Interior Design
    - ➢ Podcasting
    - ➢ Theatre
    - ➢ Painting etc.

Semester-III

S.No.	Course Type	Course Code	Course Title	Hrs./ Week			Credits
				L	T	P	
1	BSC	MA03	Probability and Statistics	2	1	-	3
2	PCC	DS01	Data Communication	2	1	-	3
3	PCC	DS02	Data Structure and Algorithm	2	1	-	3
4	PCC	DS03	Computer System Organization	2	1	-	3
5	PCC	DS04	Foundation of Data Science	2	1	-	3
6	HSMC	HS04	Entrepreneurship and Principles of Management	1	-	-	1
7	LC	DS02(P)	Data Structures and Algorithm Lab	-	-	4	2
8	LC	DS04(P)	Foundation of Data Science Lab	-	-	2	1
9	SBC	DS01(P)	Programming in Python	-	-	4	2
10	LLC	LLC02	Liberal Learning Course –II	Credits to be added in Fourth Semester			
11	MLC	MLC01	Professional Laws, Ethics, Gender, Human Values and Harmony	1	-	-	Audit
				Total Credits			21

Note:

- Liberal Learning Course-II, LLC-01 (Any One Course from NCC/NSO/NCA)
    - G. NCC
    - H. NSO
        - ➢ Anyone Sports at State Level
    - I. NCA
        - ➢ Music
        - ➢ Dance
        - ➢ Photography
        - ➢ Cinematography
        - ➢ Interior Design
        - ➢ Podcasting
        - ➢ Theatre
        - ➢ Painting etc.

Semester-IV

S.No.	Course Type	Course Code	Course Title	Hrs./ Week			Credits
				L	T	P	
1	BSC	MA04	Statistical Principles of Data Science	2	1	-	3
2	PCC	DS05	Computer Network	2	1	-	3
3	PCC	DS06	Object Oriented Programming and Methodology	2	1	-	3
4	PCC	DS07	Data Ethics	3	-	-	3
5	HSMC	HS03	Innovation and Creativity	-	-	2	1
6	IFC	CB01	Interdisciplinary Foundation Course-I	2	-	-	2
7	LC	DS05(P)	Computer Network Lab	-	-	2	1
8	LC	DS06(P)	Object Oriented Programming And Methodology Lab	-	-	4	2
9	DS08(P)	LC	R-Based Statistical Analysis	-	-	2	1
11	DS09(P)	LC	Data Visualization and Business Intelligence Lab	-	-	2	1
12	DS02(P)	SBC	Web Development Technologies	-	-	2	1
11	LLC	LLC02	Liberal Learning Course –II	-	-	2	1
12	MLC	MLC02	Constitution of India	1	-	-	Audit
						Total Credits	**22**

- **Liberal Learning Course-II, LLC02(Any One Course from NCC/NSO/NCA)**

  - **NCC**
  - **NSO**
    Anyone Sports at State Level
  - **NCA**
    - Music
    - Dance
    - Photography
    - Cinematography
    - Interior Design
    - Podcasting
    - Theatre
    - Painting, etc.

- **Interdisciplinary Foundation Course (IFC)-I, CB01**
  (Offered by Cyber Security, IoT including Blockchain Technology Branch)

  - **Blockchain Technology**

Semester–V

S.No.	Course Type	Course Code	Course Title	Hrs./ Week			Credits
				L	T	P	
1	PCC	DS10	Database Management System	2	1	-	3
2	PCC	DS11	Operating System	2	1	-	3
3	PCC	DS12	Machine Learning-I	2	1	-	3
4	PEC	DS01	Professional Elective-I	3	-	-	3
5	HSMC	HS06	Humanities and Social Sciences Open Courses - II	2	-	-	2
6	IFC	EC01	Interdisciplinary Foundation Course-II	2	-	-	2
7	LC	DS10(P)	Database Management System Lab	-	-	2	1
8	LC	DS11(P)	Operating System Lab	-	-	2	1
	LC	DS12(P)	Machine Learning-I Lab	-	-	2	1
9	SBC	DS03(P)	JAVA-Programming	-	-	2	1
10	PROJ	DS01	Mini Project	-	-	4	2
11	PROJ	-	Internship-I	Credits to be added in Sixth Semester			
12	LLC	LLC03	Liberal Learning Course -III	Credits to be added in Sixth Semester			
13	MLC	MLC03	Environmental Studies	1	-	-	Audit
						Total Credits	22

Humanities and Social Sciences Open Courses (HSMC) – II, HS06 (Any One Course)	Professional Elective Course(PEC) – I,DS01 (Any one Course)
(A) Industrial Safety Psychology	(A) Software Engineering and Project Management
(B) Project Management	(B) Data Warehousing and Mining
(C) Business Communication	(C) Agile Software Development
	(D) Theory of Computation

Interdisciplinary Foundation Course (IFC)-II, EC01

(Offered by Electronics & Communication Department)

➢ **Sensors and Automation**

Liberal Learning Course-III, LLC03 (Any One Course from NCC/NSO/NCA)
Note: pool of choices will be the same as in LLC01 and LLC02.

Semester-VI

S.No.	Course Type	Course Code	Course Title	Hrs./ Week			Credits
				L	T	P	
1	PCC	DS13	Big Data and Hadoop	2	1	-	3
2	PCC	DS14	Machine Learning-II	2	1	-	3
3	PCC	DS15	Natural Language Processing	2	1	-	3
4	PEC	DS02	Professional Elective Course -II	2	-	-	2
5	IOC	—---	Interdisciplinary Open Course-I	2	1	-	3
6	HSMC	HS05	Humanities and Social Sciences Open Courses - I	2	-		2
7	LC	DS13(P)	Big Data and Hadoop Lab	-	-	2	1
8	LC	DS14(P)	Machine Learning-II Lab	-	-	2	1
9	PROJ	DS02	Minor Project	-	-	4	2
10	PROJ	DS03	Evaluation of Internship-I	-	-	4	2
11	PROJ	–	Internship-II	Credits to be added in Seventh Semester			
12	LLC	LLC03	Liberal Learning Course -III	-	-	2	1
13	MLC	MLC04	Intellectual Property Rights	1	-	-	Audit
						Total Credits	23

Professional Elective Course(PEC) –II DS02(Any One Course)	Interdisciplinary Open Course(IOC)- I (Any One Course)	Humanities and Social Sciences Open Courses – I, HS05 (Any One Course)
(A) Cyber Security	MA01 (A) Scientific Aptitude	(A) English Language Proficiency
(B) Compiler Design*	(B) Green Technology	(B) German Language
(C) Information Storage Management	(C) Operations Research	(C) French Language
	IOC- FT (A) Fundamental of Fire & Safety	(D) Japanese Language
		(E) Soft Skills and Interpersonal Communication

Liberal Learning Course-III, LLC03(Any One Course from NCC/NSO/NCA)
Note: pool of choices will be the same as in LLC01 and LLC02.

Semester VII

S.No.	Course Type	Course Code	Course Title	Hrs./ Week			Credits
				L	T	P	
1	PCC	DS16	**Computer Vision**	2	1	-	3
2	PEC	DS03	**Professional Elective-III**	2	1	-	3
3	PEC	DS04	**Professional Elective-IV**	2	1	-	3
4	IOC	—---	**Interdisciplinary Open Course-II**	3	-	-	3
5	LC	DS16(P)	**Computer Vision Lab**	-	-	4	2
6	LC-PEC	DS03(P)	**Elective-III Lab**	-	-	2	1
7	LC-PEC	DS04(P)	**Elective-IV Lab**	-	-	2	1
8	PROJ	DS04	**Major Project Phase-I**	-	-	8	4
9	PROJ	DS05	**Evaluation of Internship-II**	-	-	6	3
						Total Credits	23

Professional Elective Course (PEC) –III,DS03(Any One Course)	Professional Elective Course (PEC) – IV,DS04 (Any One Course)	Interdisciplinary Open Course-II
(A) Mobile Application Development	**(A) Cloud Computing**	**(A)Robotics**
(B) Adversarial Machine Learning	**(B) Streaming Data & Real-Time Analytics**	**(B)Industrial Electronics**
(C) Optimization for ML	**(C) Artificial Intelligence**	**CS-01Digital Marketing & SEO**
(D) Computational Financial Modeling	**(D) Deep & Reinforcement Learning**	**(D)3D Printing & Application**

Semester VIII (SCHEME A)

S.No.	Course Type	Course Code	Course Title	Hrs./ Week			Credits
				L	T	P	
1	PEC	DS05	Elective-V	2	1	-	3
2	PEC	DS06	Elective-VI	2	1	-	3
3	LC-PEC	DS06(P)	Elective-VI Laboratory	-	-	4	2
4	PROJ	DS06(A)	Major Project Phase-II	-	-	16	8
						Total Credits	**16**

Semester VIII (SCHEME B)

S.No.	Course Type	Course Code	Course Title	Hrs./ Week			Credits
				L	T	P	
	PEC	DS05	Elective-V	2	1	-	3
2	PEC	DS06	Elective-VI	2	1	-	3
3	LC-PEC	DS06(P)	Elective-VI Laboratory	-	-	4	2
4	PROJ	DS06(B)	Project /Internship (Industry/Corporate/Academia)	-	-	16	8
						Total Credits	**16**

> **Note: In Eighth Semester, students may opt for 'SCHEME A' or 'SCHEME B'.**

Professional Elective Course(PEC)–V,DS05 (Any One Course) MOOC	Professional Elective Course(PEC)–VI,DS06 (Any One Course)
(A) Knowledge Management	**(A) Quantum Computing**
(B) Web & Information Retrieval	**(B) Tensor flow**
(C) Cognitive Modelling*	**(C) Computational Intelligence**
(D) Bio Informatics	**(D)Tableau**