

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(DATA SCIENCE)**

B.Tech Course Structure (R23 Regulations)

I B.Tech (I Sem)

Branch/Specialization:CSE (DS)

S.No.	Course Code	Name of the Course	Contact Hours per Week			Credits
			L	T	P	
1	HS101	Matrices and Calculus	3	1	0	4
2	HS105	Engineering Chemistry	3	1	0	4
3	ES101	Basic Electrical Engineering	2	0	0	2
4	ES103	Electronic Devices and Circuits	2	0	0	2
4	ES106	Programming for Problem Solving*	2	0	4	4
5	HS106	Engineering Chemistry Lab	0	0	2	1
6	ES105	Electrical and Electronics Engg. Lab	0	0	2	1
7	MC102	Morals and Ethics	1	0	0	0
Total			13	2	8	18

L: Lecture Hour

T: Tutorial Hour

P: Lab/Practice Hour

***Integrated Course (Theory & Lab)**

I B.Tech (II Sem)

Branch/Specialization:CSE (DS)

S.No.	Course Code	Name of the Course	Contact Hours per Week			Credits
			L	T	P	
1	HS102	Multivariable and Vector Calculus	3	1	0	4
2	HS103	Applied Physics	3	1	0	4
3	HS107	English for Skill Enhancement	2	0	0	2
4	ES107	Python Programming*	2	0	2	3
5	ES108	Computer Aided Engineering Graphics	1	0	4	3
6	HS104	Applied Physics Lab	0	0	3	1.5
7	HS108	English Language and Communication Skills Lab	0	0	2	1
8	ES113	Engineering Workshop Practice	0	0	3	1.5
9	ES115	IT Workshop	0	0	2	1
10	MC101	Environmental Science	1	0	0	0
Total			12	2	16	21

L: Lecture Hour

T: Tutorial Hour

P: Lab/Practice Hour

***Integrated Course (Theory & Lab)**

II B.Tech (I Sem)**Branch/Specialization:CSE (DS)**

S.No.	Course Code	Name of the Course	Contact Hours per Week			Credits
			L	T	P	
1	HS201	Computer Oriented Statistical Methods	3	1	0	4
2	EC216	Digital Electronics	3	0	0	3
3	CS206	Computer Organization and Architecture	3	0	0	3
4	CS210	Database Management Systems	3	0	0	3
5	CS201	Data Structures using C++	3	0	0	3
6	CS211	Database Management Systems Lab	0	0	2	1
7	CS202	Data Structures using C++ Lab	0	0	2	1
8	HS206	Verbal Communications and Soft Skills Lab	0	0	2	1
9	CS213	Node JS / React JS / Django Lab	0	0	2	1
10	MC201	Constitution of India	1	0	0	0
Total			16	1	8	20

L: Lecture Hour**T: Tutorial Hour****P: Lab/Practice Hour****II B.Tech (II Sem)****Branch/Specialization:CSE (DS)**

S.No.	Course Code	Name of the Course	Contact Hours per Week			Credits
			L	T	P	
1	HS207	Business Economics & Financial Analysis	3	0	0	3
2	CS203	Object Oriented Programming through Java	3	0	0	3
3	CS205	Discrete Mathematics	3	0	0	3
4	CS208	Operating Systems	3	0	0	3
5	CS301	Software Engineering	3	0	0	3
6	CS204	Object Oriented Programming through Java Lab	0	0	2	1
7	CS209	Operating System Lab	0	0	2	1
8	CS222	Real -time Research Project/Societal Related project	0	0	4	2
9	CS326	UI Design- Flutter Lab	0	0	2	1
10	MC202	Gender Sensitization Lab	0	0	2	0
Total			15	0	12	20

L: Lecture Hour**T: Tutorial Hour****P: Lab/Practice Hour**

III B.Tech (I Sem)**Branch/Specialization:CSE (DS)**

S.No.	Course Code	Name of the Course	Contact Hours per Week			Credits
			L	T	P	
1	CS345	Introduction to Data Science	3	0	0	3
2	CS304	Data Mining	3	0	0	3
3	CS212	Design and Analysis of Algorithms	3	1	0	4
4		Open Elective-1 (See Annexure – A)	3	0	0	3
5		Professional Elective – 1	3	0	0	3
	CS325	(a) Cloud Computing				
	CS321	(b) Information Retrieval Systems				
	CS414	(c) Pattern Recognition				
	CS328	(d) Computer Graphics				
	CS311	(e) Image Processing				
6	CS346	Data Science with R Programming Lab	0	0	2	1
7	CS305	Data Mining Lab	0	0	2	1
8	CS344	Web Programming Lab	0	0	2	1
9	CS335	ETL-Kafka/Talend Lab	0	0	2	1
Total			15	1	8	20

L: Lecture Hour**T: Tutorial Hour****P: Lab/Practice Hour****III B.Tech (II Sem)****Branch/Specialization:CSE (DS)**

S.No.	Course Code	Name of the Course	Contact Hours per Week			Credits
			L	T	P	
1	CS318	Big Data Analytics	3	0	0	3
2	CS315	Machine Learning	3	0	0	3
3	CS221	Automata Theory and Compiler Design	3	0	0	3
4		Open Elective – 2 (See Annexure – A)	3	0	0	3
5		Professional Elective – 2	3	0	0	3
	CS407	(a) Scripting Languages				
	CS415	(b) Mobile Application Development				
	CS409	(c) Software Testing Methodologies				
	CS406	(d) Full Stack Development				
	CS410	(e) Computer Vision and Robotics				
6	CS316	Machine Learning Lab	0	0	4	2
7	HS301	Advanced English Communication Skills Lab	0	0	2	1
8	CS319	Big Data Analytics Lab	0	0	4	2
9	CS343	Industry Oriented Mini Project / Summer Internship	0	0	4	2
10	MC301	Intellectual Property Rights	1	0	0	0
Total			16	0	14	22

L: Lecture Hour**T: Tutorial Hour****P: Lab/Practice Hour**

IV B.Tech (I Sem)
Branch/Specialization:CSE (DS)

S.No.	Course Code	Name of the Course	Contact Hours per Week			Credits
			L	T	P	
1	CS430	Web and Social Media Analytics	3	0	0	3
2	CS476	Data Visualization and Exploration with R	3	0	0	3
3		Open Elective -3 (See Annexure – A)	3	0	0	3
4		Professional Elective – 3	3	0	0	3
	CS401	(a) Cryptography and Network Security				
	CS423	(b) Deep Learning				
	CS418	(c) Agile Software Development				
	CS219	(d) Introduction to Artificial Intelligence				
	CS432	(e) Financial Analytics				
5		Professional Elective – 4	3	0	0	3
	CS428	(a) Quantum Computing				
	CS433	(b) Predictive Analytics				
	CS434	(c) Database Security				
	CS320	(d) Distributed Databases				
	CS436	(e) Internet of Things				
6	CS431	Web and Social Media Analytics Lab	0	0	2	1
7	CS477	Data Visualization and Exploration with R Lab	0	0	2	1
8	CS416	Project Work Stage – I	0	0	6	3
Total			15	0	10	20

L: Lecture Hour
T: Tutorial Hour
P: Lab/Practice Hour
IV B.Tech (II Sem)
Branch/Specialization:CSE (DS)

S.No.	Course Code	Name of the Course	Contact Hours per Week			Credits
			L	T	P	
1	CS417	MOOCS (Any subject which is not 70% same of previous subjects syllabus) – Swayam NPTEL Course	2	0	0	2
2		Professional Elective – 5	3	0	0	3
	CS435	(a) Healthcare Data Analytics				
	CS453	(b) Privacy Preserving in Data Mining				
	CS454	(c) Exploratory Data Analysis				
	CS455	(d) Nature Inspired Computing for Data Science				
	CS456	(e) Mining Massive Datasets				
3		Professional Elective – 6	3	0	0	3
	CS408	(a) Block Chain Technology				
	CS429	(b) Parallel and Distributed Computing				
	CS457	(c) Data Stream Mining				
	CS458	(d) Web and Data Security				
	CS459	(e) Video Analytics				
4	CS478	Project Work Stage-II and Seminar	0	0	22	11
Total			8	0	22	19

L: Lecture Hour
T: Tutorial Hour
P: Lab/Practice Hour