JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURJADA VZM
VIZIANAGARAM – 535 003, Andhra Pradesh, India

B. Tech CSE (DATA SCIENCE)

(R23-COURSE STRUCTURE)

(Applicable from the academic year 2023-24 and onwards)

B.Tech.– I Year I Semester

S. No.	Course Code	Course Name	L	T	P	Credits
1.	R23BS01	Linear Algebra & Calculus	3	0	0	3
2.	R23BS03	Engineering Physics	3	0	0	3
3.	R23HS01	Communicative English	2	0	0	2
4.	R23ES01	Basic Civil &Mechanical Engineering	3	0	0	3
5.	R23ES07	Introduction to Programming	3	0	0	3
6.	R23HS01	Communicative English Lab	0	0	2	1
7.	R23BS03	Engineering Physics Lab	0	0	2	1
8.	R23ES02	Engineering Workshop	0	0	3	1.5
9.	R23ES06	IT Workshop	0	0	2	1
10.	R23ES07	Computer Programming Lab	0	0	3	1.5
11.	R23MC01	Health and Wellness, Yoga and Sports	0	0	1	0.5
		Total				**20.5**

B.Tech.– I Year II Semester

S. No.	Course Code	Course Name	L	T	P	Credits
1.	R23BS02	Differential Equations and Vector calculus	3	0	0	3
2.	R23BS05	Chemistry	3	0	0	3
3.	R23ES03	Engineering Graphics	1	0	4	3
4.	R23ES04	Basic Electrical & Electronics Engineering	3	0	0	3
5.	R23PC04	Data Structures	3	0	0	3
6.	R23BS05	Chemistry Lab	0	0	2	1
7.	R23ES05	Electrical & Electronics Engineering workshop	0	0	3	1.5
8.	R23PC04	Data Structures Lab	0	0	3	1.5
9.	R23MC02	NSS/NCC/Scouts &Guides/Community Service	0	0	1	0.5
		Total				**19.5**

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(Applicable from the academic year 2023-24 and onwards)

B.Tech.– II Year I Semester

S. No.	Category	Title	L	T	P	Credits
1	Basic Science	Discrete Mathematics & Graph Theory	3	0	0	3
2	HSMC	Universal Human Values - Understanding Harmony & Ethical Human Conduct	2	1	0	3
3	Engineering Science	Introduction to Data Science	3	0	0	3
4	Professional Core	Advanced Data Structures Algorithms Analysis	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Data Science Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement course	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			**16**	**2**	**8**	**20**

B.Tech.– II Year II Semester

S. No.	Category	**Title**	**L**	**T**	**P**	**Credits**
1	Basic Science	Probability And Stastics	2	0	0	2
2	Engineering Science / Basic Science	Statistical Methods for Data Science	3	0	0	3
3	Professional Core	Data Engineering	3	0	0	3
4	Professional Core	Database Management System	3	0	0	3
5	Professional Core	Digital Logic& Computer Organization	3	0	0	3
6	Professional Core	Data Engineering Lab	0	0	3	1.5
7	Professional Core	Database Management System Lab	0	0	3	1.5
8	Skill Enhancement Course	Exploratory Data Analysis with Python	0	1	2	2
9	Engineering Science	Design Thinking & Innovation	1	0	2	2
Total			**15**	**1**	**10**	**21**
Mandatory Community Service Project Internship of 08weeks duration during summer vacation						

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(R23-COURSE STRUCTURE)

(Applicable from the academic year 2023-24 and onwards)

B.Tech. – III Year I Semester

S. No.	Category	Title	L	T	P	Credits
1	Professional Core	Operating System	3	0	0	3
2	Professional Core	Machine Learning\	3	0	0	3
3	Professional Core	Computer Networks	3	0	0	3
4	Professional Elective-I	1. Soft computing 2. Software Engineering 3. Digital Twin 4. Predictive Analytics 5. Any of 12 Week Course Swayam /NPTEL Course suggested by BOS	3	0	0	3
5	Open Elective- I	Managerial Economics & Financial Analysis	3	0	0	3
6	Professional Core	Machine Learning Lab	0	0	3	1.5
7	Professional Core	Computer Networks Lab	0	0	3	1.5
8	Skill Enhancement course	MEAN Stack Technologies	0	1	2	2
9	ES	Tinkering Lab	0	0	2	1
10	Evaluation of Community Service Internship		-	-	-	2
Total			15	1	10	23

Note: - Managerial Economics & Financial Analysis is Mandatory.

B.Tech.– III Year II Semester

S.No.	Category	Title	L	T	P	Credits
1	Professional Core	Massive Data Analytics	3	0	0	3
2	Professional Core	Deep Learning	3	0	0	3
3	Professional Core	Automata Theory & Compiler Design	3	0	0	3
4	Professional Elective-II	1. Model Evaluation and Selection 2. Internet of Things 3. Recommender Systems 4. Quantum computing 5. 12-Week SWAYAM /NPTEL Course suggested by the BoS	3	0	0	3
5	Professional Elective-III	1. Computer Vision 2. Cryptography & Network Security 3. AI chatbot 4. CYBER SECURITY 5. 12-Week SWAYAM /NPTEL Course suggested by the BoS	3	0	0	3
6	Open Elective – II	**Open elective offered by other department**	3	0	0	3
7	Professional Core	Deep Learning Lab	0	0	3	1.5
8	Professional Core	Massive Data Analytics Lab	0	0	3	1.5
9	Skill Enhancement course	Soft skills	0	1	2	2
10	Audit Course	Technical Paper Writing & IPR	2	0	0	-
Total			**19**	**1**	**06**	**23**
Mandatory Industry Internship of 08 weeks duration during summer vacation						

B.Tech. – IV Year I Semester

S. No.	Category	Title	L	T	P	Credits
1	Professional Core	Data Wrangling & Visualization	3	0	0	3
2	Management Course- II	Management Science Human Resource Management Entrepreneurship & Incubation	2	0	0	2
3	Professional Elective-IV	1. Cloud Computing 2. Software Testing Methodology 3. DevOps 4. NoSQL databases 5. 12-Week SWAYAM /NPTEL Course suggested by the BoS	3	0	0	3
4	Professional Elective-V	1. Model Evaluation & Selection 2. Expert Systems 3. Reinforcement Learning 4. HPC (High-Performance Computing) 5. 12-Week SWAYAM /NPTEL Course suggested by the BoS	3	0	0	3
5	Open Elective-III	**Open elective offered by other department**	3	0	0	3
6	Open Elective-IV	**Open elective offered by other department**	3	0	0	3
7	Skill Enhancement Course	Prompt Engineering	0	1	2	2
8	Audit Course	Gender Sensitization	2	0	0	-
9	Internship	Evaluation of Industry Internship	-	-	-	2
		Total	**19**	**1**	**02**	**21**

B.Tech.– IV Year II Semester

S. No.	Category	Title	L	T	P	Credits
1	Internship & Project Work	Full semester Internship & Project Work	0	0	24	12

OPEN ELECTIVES OFFERED BY CSE(DS) TO OTHER BRANCHES:

OPEN ELECTIVE -I	OPEN ELECTIVE -II
1. Fundamentals of Data Science 2. Exploratory Data Analysis with Python 3. Internet of Things	1. Fundamentals of Data Base Management System 2. Data Wrangling and Pre-processing 3. Social Media Analytics
OPEN ELECTIVE -III	**OPEN ELECTIVE -IV**
1. Introduction to Artificial Intelligence 2. Data science applications 3. Java Programming	1. Introduction to Machine Learning 2. Block Chain Technologies 3. AI Chabot