



## **MARRI LAXMAN REDDY** **INSTITUTE OF TECHNOLOGY AND MANAGEMENT**

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

### **B.Tech - Computer Science and Engineering (Data Science)** **COURSE STRUCTURE (R20)** **Applicable From 2020-21 Admitted Batch** **Structure Breakup**

S.No	Category	Breakup of credits (Total 160 credits)
1	Humanities and Social sciences including Management Courses (HSMC)	10
2	Basic Sciences Courses (BS)	22
3	Engineering Sciences courses including workshop, drawing basics of electrical/mechanical/computer etc.(ES)	19
4	Professional Core courses (PC)	68
5	Professional Electives (PE)	18
6	Open Electives (OE)	9
7	Project work, Seminar and internship in industry or elsewhere (PS)	14
8	Mandatory Courses(MC)	-
	<b>TOTAL</b>	<b>160</b>

**I YEAR I SEMESTER**

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2010001	Engineering Mathematics - I	BS	3	1	0	4	30	70	100
2	2010006	Applied Physics	BS	3	1	0	4	30	70	100
3	2010501	Programming for Problem Solving	ES	3	1	0	4	30	70	100
4	2010009	Communicative English	HSMC	2	0	0	2	30	70	100
5	2010071	Applied Physics Lab	BS	0	0	3	1.5	30	70	100
6	2010571	Programming for Problem Solving Lab	ES	0	0	3	1.5	30	70	100
7	2010074	Communicative English Lab	HSMC	0	0	2	1	30	70	100
<b>Total Credits</b>				<b>11</b>	<b>3</b>	<b>8</b>	<b>18</b>	<b>210</b>	<b>490</b>	<b>700</b>

**I YEAR II SEMESTER**

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2020002	Engineering Mathematics - II	BS	3	1	0	4	30	70	100
2	2020008	Engineering Chemistry	BS	3	1	0	4	30	70	100
3	2020502	Data Structures	ES	3	0	0	3	30	70	100
4	2020371	Engineering Drawing practice	ES	1	0	4	3	30	70	100
5	2020073	Engineering Chemistry Lab	BS	0	0	3	1.5	30	70	100
6	2020572	Data Structures Lab	ES	0	0	2	1	30	70	100
7	2020372	Engineering Workshop	ES	1	0	3	2.5	30	70	100
8	2020021	Environmental Science	MC	2	0	0	0	-	-	-
<b>Total Credits</b>				<b>13</b>	<b>2</b>	<b>12</b>	<b>19</b>	<b>210</b>	<b>490</b>	<b>700</b>

**II YEAR I SEMESTER**

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2036701	Database Management Systems	PC	3	0	0	3	30	70	100
2	2036702	Operating Systems	PC	3	0	0	3	30	70	100
3	2036703	Digital Logic Design & computer Organization	PC	3	1	0	4	30	70	100
4	2030004	Probability & Statistics	BS	3	0	0	3	30	70	100
5	2036704	Python Programming	PC	3	0	0	3	30	70	100
6	2036771	Operating Systems Lab	PC	0	0	3	1.5	30	70	100
7	2036772	Database Management Systems Lab	PC	0	0	3	1.5	30	70	100
8	2036773	Python Programming Lab	PC	0	0	3	1.5	30	70	100
9	2030025	Gender Sensitization	MC	2	0	0	0	-	-	-
<b>Total Credits</b>				<b>17</b>	<b>1</b>	<b>9</b>	<b>20.5</b>	<b>240</b>	<b>560</b>	<b>800</b>

**II YEAR II SEMESTER**

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2046705	Discrete Mathematics	PC	3	1	0	4	30	70	100
2	2040201	Basic Electrical Engineering	ES	3	0	0	3	30	70	100
3	2040010	Business Economics and Financial Analysis	HSMC	3	0	0	3	30	70	100
4	2046706	JAVA Programming	PC	3	0	0	3	30	70	100
5	2046707	Introduction to Data Science	PC	3	0	0	3	30	70	100
6	2046708	Data Warehousing & Data Mining	PC	2	0	0	2	30	70	100
7	2030271	Basic Electrical Engineering Lab	ES	0	0	2	1	30	70	100
8	2046774	Data Warehousing & Data Mining Lab	PC	0	0	2	1	30	70	100
9	2046775	JAVA Programming Lab	PC	0	0	3	1.5	30	70	100
10	2040023	Constitution of India	MC	2	0	0	0	-	-	-
<b>Total Credits</b>				<b>19</b>	<b>1</b>	<b>7</b>	<b>21.5</b>	<b>270</b>	<b>630</b>	<b>900</b>

**III YEAR I SEMESTER**

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2056709	Computer networks	PC	3	0	0	3	30	70	100
2	2056710	Machine Learning	PC	3	0	0	3	30	70	100
3	2056711	Design and Analysis of Algorithms	PC	3	0	0	3	30	70	100
4	2056712	Software Engineering	PC	3	0	0	3	30	70	100
5		Open elective-I	OE	3	0	0	3	30	70	100
6	2056776	Computer networks Lab	PC	0	0	3	1.5	30	70	100
7	2056777	Machine Learning Lab using Python	PC	0	0	3	1.5	30	70	100
8	2056778	Case Tools Lab	PC	0	0	2	1	30	70	100
9	2056783	Internship*	PS	0	0	2	1	30	70	100
10	2020024	Intellectual Property Rights	MC	2	0	0	0	-	-	-
<b>Total Credits</b>				<b>17</b>	<b>0</b>	<b>10</b>	<b>20</b>	<b>270</b>	<b>630</b>	<b>900</b>

**III YEAR II SEMESTER**

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2066713	Automata Theory & Language Processors	PC	3	0	0	3	30	70	100
2	2066714	Data Analytics	PC	3	0	0	3	30	70	100
3	2066715	Web Technology	PC	3	0	0	3	30	70	100
4		Professional Elective I	PE	3	0	0	3	30	70	100
5		Open Elective II	OE	3	0	0	3	30	70	100
6	2066779	Web Technology Lab	PC	0	0	3	1.5	30	70	100
7	2066780	Data analytics Lab	PC	0	0	3	1.5	30	70	100
8	2060075	Advanced English Communication Lab	HSMC	0	0	2	1	30	70	100
9		Professional Ethics	MC	2	0	0				
<b>Total Credits</b>				<b>17</b>	<b>0</b>	<b>8</b>	<b>19</b>	<b>240</b>	<b>560</b>	<b>800</b>

\*Students have to complete internship in II Year- II Semester Summer break, Evaluation is carried in III-I semester.

**IV YEAR I SEMESTER**

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2076717	Fundamentals of Management	HSMC	3	0	0	3	30	70	100
2	2076716	Business intelligence	PC	3	0	0	3	30	70	100
3	2076717	Deep Learning	PC	3	0	0	3	30	70	100
4		Professional Elective II	PE	3	0	0	3	30	70	100
5		Professional Elective III	PE	3	0	0	3	30	70	100
6		Open Elective III	OE	3	0	0	3	30	70	100
7	2076781	Business intelligence Lab	PC	0	0	2	1	30	70	100
8	2076782	Deep learning lab	PC	0	0	2	1	30	70	100
9	2076784	Industry Oriented Mini Project**	PS	0	0	4	2	30	70	100
<b>Total Credits</b>				18	0	8	22	<b>270</b>	<b>630</b>	<b>900</b>

**IV YEAR II SEMESTER**

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1		Professional Elective IV	PE	3	0	0	3	30	70	100
2		Professional Elective V	PE	3	0	0	3	30	70	100
3		Professional Elective VI	PE	3	0	0	3	30	70	100
4	2086785	Technical Seminar	PS	0	0	2	1	30	70	100
5	2086786	Major Project	PS	0	0	20	10	30	70	200
<b>Total Credits</b>				9	0	22	20	<b>150</b>	<b>350</b>	<b>500</b>

**\*\*Students have to complete industry oriented mini project in III Year- II Semester Summer break, Evaluation is carried in IV-I semester.**

**PE I - Professional Elective I**

S.No	Course Code	Course Title
1	2066741	Embedded Systems
2	2066742	Computer Graphics
3	2066743	Parallel Computing
4	2066744	Artificial Intelligence

**PE II - Professional Elective II**

S.No	Course Code	Course Title
1	2076745	Linux Programming
2	2076746	Distributed System
3	2076747	Cryptography and Network Security
4	2076748	Software project Management

**PEIII – Professional Elective III**

S.No	Course Code	Course Title
1	2076749	Wireless Sensor Networks
2	2076750	Design Thinking
3	2076751	Cyber Forensics
4	2076752	Image and Video Processing

**PE IV - Professional Elective**

S.No	Course Code	Course Title
1	2086753	Mobile Computing
2	2086754	Natural Language Processing
3	2086755	Semantic Web
4	2086756	Big Data Analytics

**PE V - Professional Elective V**

S.No	Course Code	Course Title
1	2086757	Artificial Neural Networks
2	2086758	Middleware Technologies
3	2086759	Virtual Reality
4	2086760	Block Chain Technology

**PE VI - Professional Elective VI**

S.No	Course Code	Course Title
1	2086761	Robotics
2	2086762	Cloud Computing
3	2086763	Web Services
4	2086764	Internet of Things

**Open Electives**

<b>S.No</b>	<b>Course Code</b>	<b>Course Title</b>
1	Open Elective I	2046706- Java Programming
		2036701- Database Management System
2	Open Elective II	2066714- Data Analytics
		2056708-Machine Learning
3	Open Elective III	2076717- Deep Learning
		2086718- R Programming