

1.3.2 Details of value-added courses for imparting transferable and life skills

Department of Information Technology

Index

S. No	Name of the Value-Added Courses offered	Page No.
1	Data Science	1
2	AI and ML Applications through Python	4
3	AR 19 Curriculum Highlighted with CC & EC Activities-II	12
4	AR 20 Curriculum Highlighted with CC & EC Activities-I	18

CIRCULAR

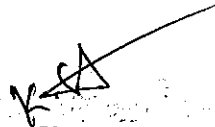
Ref: Stu/ Cir 1 /21-22/I Sem

Date:10-11-2021

Department Information Technology is organizing a VALUE ADDED course / training on "DATA SCIENCE" during 15th – 24th December (30 Hours Online Mode). All the 2nd year 3rd Semester Students are asked to enroll for this course and is informed to attend the training without Fail.

Online Link: <https://teams.microsoft.com/l/team/19%3azF-DRKGjS17id4jSJS-Wnk4UsqgjWsMIQXhF7hwPn0E1%40thread.tacv2/conversations?groupId=d6d3df70-dfdc-424e-9ecd-cce834c95d4f&tenantId=1cdf34f3-08f9-43eb-9d4f-2ba4a1d20a6f>

1. List of Students-enclosed
2. Schedule of the course


Coordinator


HOD-IT

DEPARTMENT: IT – 4th Sem. – A

ACADEMIC YEAR: 2021 –22

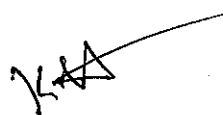
Venue: Online Mode

Admitted Batch: 2020-2024

Value Added Course Name: Data Science

Student Registration

S.No.	JNTU No.	Name of the Student
1	20341A1201	ADAPA SAI KUMAR
2	20341A1202	ADAPA SIVA
3	20341A1203	ADDURU DRAKSHAYANI
4	20341A1204	ADIMULAMU HEMALATHA
5	20341A1205	AMUJURI VENU
6	20341A1206	ARJANGI NANDINI
7	20341A1207	ATYAM MANIKANTA LAKSHMI NARAYANA
8	20341A1212	BODDU JAGADEESH SAI
9	20341A1214	BUDI HYMA
10	20341A1215	BUDIDA KUSHANK REDDY
11	20341A1217	CHAVVAKULA BHAVITHA
12	20341A1218	CHERUVU NAGALAKSHMI GOVARDHINI
13	20341A1221	DOLA SHAMITHA
14	20341A1228	GEMBALI SUSMITHA
15	20341A1233	GYANSREE HIRAWAT
16	20341A1234	HARI HEMANTH KUMAR
17	20341A1235	JAMI SUSMITHA
18	20341A1236	JANGAM SANKETH ROHI
19	20341A1243	KANDALADA SAI SASI KIRAN
20	20341A1246	KARRI SRI RAKESH REDDY
21	20341A1247	KATTAMURI VISHAL
22	20341A1252	KORASALA GANESH ABHITEJA
23	20341A1253	KORLA SURYA KIRAN
24	20341A1254	KOTLA LAKSHMINARAYANA
25	20341A1257	LENKA VENKATA SEETHA RAMA LAKSHMI
26	20341A1258	LOTHUGEDDA CHANIKYA NAIDU
27	20341A1259	MADDALA CHAITANYA VENKATA SAI SYAMALA RAO
28	20341A1263	MANEPALLI DHARANI PUJITHA
29	20341A1264	MATTA NAGESWARARAO
30	21345A1201	VELICHETI GNANASAI
31	21345A1202	MADUGULA SOWJANYA
32	21345A1203	RAJPUROHITH JAGADEESH
33	21345A1205	KANAKAM SWATHI
34	21345A1206	POOSARLA GANGADHAR


 Signature of Coordinator


 Signature of HoD

DEPARTMENT: IT – 4th Sem. – B

ACADEMIC YEAR: 2021 –22

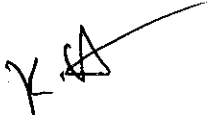
Venue: Online Mode

Admitted Batch: 2020-2024

Value Added Course Name: Data Science

Student Registration

S.No.	JNTU No.	Name of the Student
1	20341A1267	MEDISETTY MADHURI
2	20341A1270	MOHAN KRISHNA KOPPULA
3	20341A1271	MUDAPAKA VINAY KUMAR
4	20341A1272	MULAKALA SRI LAKSHMI VENKATAPRASANNASWATHI
5	20341A1273	MUPPIDI HEMA VENKATARAMANA
6	20341A1274	MURAPAKA HEMA KALYAN
7	20341A1277	NANDAM SRI MOULI
8	20341A1278	NEKKALAPU NITHIN CHAITHANYA
9	20341A1283	PARIMI LEELA SRI SRUJAN
10	20341A1287	PERUMALI SREEVATSAV
11	20341A1290	PISINI MANI BHARGAV
12	20341A1291	PITHANI THARUN SAI KUMAR
13	20341A1297	RAJITHA BODDEPALLI
14	20341A1299	ROBBI JYOTHSNA
15	20341A12A0	SABBAVARAPU GIRIJA KUMAR
16	20341A12A1	SAIKRISHNA POLA
17	20341A12A2	SANDAKA MANOJ KUMAR
18	20341A12A3	SATTARU VANDANA SREE
19	20341A12A4	SHAIK ABDULLA
20	20341A12A5	SHAIK GHOUSE BASHA
21	20341A12A6	SHAIK MAHAMMAD AKBAR
22	20341A12A7	SIRUVURU RAMA KRISHNA RAJU
23	20341A12A9	SRUNGARAPU NITEESH KUMAR
24	20341A12B3	TADROTU SAI CHARAN
25	20341A12B4	TALABHAKTULA GOWTHAM
26	20341A12B8	VANAPALLI GOWTHAM SAI
27	20341A12B9	VANGALAPUDI DEVI PRIYA
28	20341A12C0	VANJARAPU ANUSHA
29	20341A12C1	VELAGA VISHNU VARDHAN
30	20341A12C2	VELISI NIRMALA PRIYA
31	20341A12C3	VELPULA BHARATH
32	20341A12C4	VYAKARANAM VENKATA SESI KUMAR
33	20341A12C5	VYSYARAJU VENKATA RAMA RAJU
34	20341A12C6	YAGATI MADHURI
35	21345A1208	TELUKALA ANIL KUMAR
36	21345A1209	TELUKALA CHARAN SAHU
37	21345A1210	NELLI YASWANATH KUMAR



Signature of Coordinator



Signature of HoD

CIRCULAR

Ref: Stu/ Cir 2 /21-22/II Sem

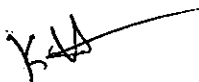
Date:15-04-2022

Department Information Technology is organizing a VALUE ADDED course / training on "AI and ML Applications through PYTHON" during 20th – 29th April (30 Hours Online Mode). All the 2nd year 4th Semester Students are asked to enroll for this course and is informed to attend the training without Fail.

Online Link:

https://teams.microsoft.com/l/team/19%3avkw5BE34PmDSKvqJym_AZjGRuJ-szI3PqwkFNXgh6HA1%40thread.tacv2/conversations?groupId=3e07b229-4827-4ec5-9d4d-580ec83f5af9&tenantId=1cdf34f3-08f9-43eb-9d4f-2ba4a1d20a6f

1. List of Students-enclosed
2. Schedule of the course



Coordinator



HOD-IT

DEPARTMENT: IT – 4th Sem. – A

ACADEMIC YEAR: 2021 –22

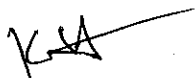
Venue: Online Mode

Admitted Batch: 2020-2024

Value Added Course Name: AI and ML Applications through PYTHON

Student Registration

S.No.	JNTU No.	Name of the Student
1	20341A1201	ADAPA SAI KUMAR
2	20341A1202	ADAPA SIVA
3	20341A1203	ADDURU DRAKSHAYANI
4	20341A1204	ADIMULAMU HEMALATHA
5	20341A1205	AMUJURI VENU
6	20341A1206	ARJANGI NANDINI
7	20341A1207	ATYAM MANIKANTA LAKSHMI NARAYANA
8	20341A1212	BODDU JAGADEESH SAI
9	20341A1214	BUDI HYMA
10	20341A1215	BUDIDA KUSHANK REDDY
11	20341A1217	CHAVVAKULA BHAVITHA
12	20341A1218	CHERUVU NAGALAKSHMI GOVARDHINI
13	20341A1221	DOLA SHAMITHA
14	20341A1228	GEMBALI SUSMITHA
15	20341A1233	GYANSREE HIRAWAT
16	20341A1234	HARI HEMANTH KUMAR
17	20341A1235	JAMI SUSMITHA
18	20341A1246	KARRI SRI RAKESH REDDY
19	20341A1247	KATTAMURI VISHAL
20	20341A1252	KORASALA GANESH ABHITEJA
21	20341A1253	KORLA SURYA KIRAN
22	20341A1254	KOTLA LAKSHMINARAYANA
23	20341A1257	LENKA VENKATA SEETHA RAMA LAKSHMI
24	20341A1258	LOTHUGEDDA CHANIKYA NAIDU
25	20341A1259	MADDALA CHAITANYA VENKATA SAI SYAMALA RAO
26	20341A1263	MANEPALLI DHARANI PUJITHA
27	20341A1264	MATTA NAGESWARARAO
28	21345A1201	VELICHETI GNANASAI
29	21345A1202	MADUGULA SOWJANYA
30	21345A1203	RAJPUROHITH JAGADEESH
31	21345A1205	KANAKAM SWATHI
32	21345A1206	POOSARLA GANGADHAR



Signature of Coordinator



Signature of HoD

DEPARTMENT: IT – 4th Sem. – B

ACADEMIC YEAR: 2021 –22

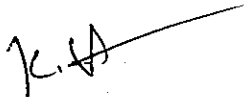
Venue: Online Mode

Admitted Batch: 2020-2024

Value Added Course Name: AI and ML Applications through PYTHON

Student Registration

S.No.	JNTU No.	Name of the Student
1	20341A1267	MEDISETTY MADHURI
2	20341A1270	MOHAN KRISHNA KOPPULA
3	20341A1271	MUDAPAKA VINAY KUMAR
4	20341A1272	MOLAKALA SRI LAKSHMI
5	20341A1273	MUPPIDI HEMA VENKATARAMANA
6	20341A1274	MURAPAKA HEMA KALYAN
7	20341A1277	NANDAM SRI MOULI
8	20341A1278	NEKKALAPU NITHIN CHAITHANYA
9	20341A1283	PARIMI LEELA SRI SRUJAN
10	20341A1287	PERUMALI SREEVATSAV
11	20341A1290	PISINI MANI BHARGAV
12	20341A1291	PITHANI THARUN SAI KUMAR
13	20341A1297	RAJITHA BODDEPALLI
14	20341A1299	ROBBI JYOTHSNA
15	20341A12A0	SABBAVARAPU GIRIJA KUMAR
16	20341A12A1	SAIKRISHNA POLA
17	20341A12A2	SANDAKA MANOJ KUMAR
18	20341A12A3	SATTARU VANDANA SREE
19	20341A12A4	SHAIK ABDULLA
20	20341A12A5	SHAIK GHOUSE BASHA
21	20341A12A6	SHAIK MAHAMMAD AKBAR
22	20341A12A9	SRUNGARAPU NITEESH KUMAR
23	20341A12B3	TADROTU SAI CHARAN
24	20341A12B4	TALABHAKTULA GOWTHAM
25	20341A12B8	VANAPALLI GOWTHAM SAI
26	20341A12B9	VANGALAPUDI DEVI PRIYA
27	20341A12C0	VANJARAPU ANUSHA
28	20341A12C1	VELAGA VISHNU VARDHAN
29	20341A12C2	VELISI NIRMALA PRIYA
30	20341A12C3	VELPULA BHARATH
31	20341A12C4	VYAKARANAM VENKATA SESI KUMAR
32	20341A12C5	VYSYARAJU VENKATA RAMA RAJU
33	20341A12C6	YAGATI MADHURI
34	21345A1208	TELUKALA ANIL KUMAR



Signature of Coordinator



Signature of HoD

Department of Information Technology GMR Institute of Technology

SYLLABUS-VALUE ADDED COURSE ON DATA SCIENCE FOR SECOND YEAR IT (2021-2022)

(Section A and B) STUDENTS

S.No	Dates	Day	Topics	Time	No.of hours
1	15/11/2021	MONDAY	Basics of AI & Introduction - Artificial Intelligence - Environmental Constraints - Various Agent Types - PEAS Analysis of Problem - CSP-Introduction - Process flow for an AI agent - Machine Learning Introduction - Supervised & Unsupervised Learning - Regression & Classification Problems - Advantages & Disadvantages of Naïve Bayes Models	2:30 to 5:30 PM	3 HOURS
2	16/11/2021	TUESDAY	Introduction to Python Programming - What is Python? - Installing Anaconda - Understanding the Spyder Integrated Development Environment(IDE) - Python basics and string manipulation - Lists, tuples, dictionaries, variables - Control Structure – If loop, For loop and while Loop - Single line loops - Writing user-defined functions - Object-oriented programming - Working with Class & Inheritance	2:30 to 5:30 PM	3 HOUR
3	17/11/2021	WEDNESDAY	Data Structure & Data Manipulation in Python - Intro to Numpy Arrays - Creating arrays - Indexing, Data Processing using Arrays - Mathematical computing basics - Basic statistics - File Input and Output - Getting Started with Pandas	2:30 to 5:30 PM	3 HOURS
4	18/11/2021	THURSDAY FN SESSION	- Data Acquisition(Import & Export) - Selection and Filtering - Combining and Merging Data Frames - Removing Duplicates & String Manipulation	10:00 to 11:30 AM	1.5 HOUR

			Visualization in python • Introduction to Visualization • Visualization Importance • Working with Python Visualization libraries • Matplotlib • Creating Line Plots, Bar Charts, Pie Charts, Histograms, Scatter Plots	11:30 to 1:00 PM	1.5 HOUR
5	19/11/2021	FRIDAY AN SESSION	Linear Regression • Regression Problem Analysis • Mathematical modeling of Regression Model • Gradient Descent Algorithm • Programming Process Flow • Use cases • Programming Using python • Building simple Univariate Linear Regression Model • Multivariate Regression Model • Boston Housing Prizes Prediction • Cancer Detection Predictive Analysis • Best Fit Line and Linear Regression	2:30 to 4:00 PM	1.5 HOUR
			Decision Trees • Forming a Decision Tree • Components of Decision Tree • Mathematics of Decision Tree • Decision Tree Evaluation • Practical Examples & Case Study • Random Forest	4:00 to 5:30 PM	1.5 HOUR
6	20/11/2021	SATURDAY	Naïve Bayes • Bayesian Theorem • Probabilities-The Prior and Posterior Probabilities • Conditional and Joint Probabilities Notion • Traditional Approach – Extract Important Features • Naïve Approach – Independence of Features Assumption • Data Processing – Discretization of Features	10:00 to 11:30 AM	1.5 HOUR
			Logistic Regression • Problem Analysis • Cost Function Formation • Mathematical Modeling • Use Cases • Digit Recognition using Logistic Regression	11:30 to 01:00 PM	1.5 HOUR
7	21/11/2021	SUNDAY	Artificial Neural Networks • Neurons, ANN & Working • Single Layer Perceptron Model	10:00 to 01:00 PM	3 HOUR

			• Multilayer Neural Network • Feed Forward Neural Network • Gradient Descent Algorithm		
08	22/11/2021	MONDAY	• Backpropagation Algorithm & Mathematical Modelling • Programming Flow for backpropagation algorithm • Use Cases of ANN • Programming SLNN using Python • Programming MLNN using Python • Digit Recognition using MLNN • XOR Logic using MLNN & Back – Propagation • Diabetes Data Predictive Analysis using ANN	1:00 to 04:00 PM	3 HOUR
			Support Vector Machine • Concept and Working Principle • Mathematical Modelling • Optimization Function Formation • The Kernel Method and Nonlinear Hyperplanes • Use Cases • Programming SVM using Python • Character recognition using SVM • Regression problem using SVM • Wisconsin Cance Detection using SVM	01:00 to 04:00 PM	3 HOUR
09	23/11/2021	MONDAY	K.Mean Cluster	2:30 to 04:00 PM	1.5 HOUR
			Computer vision with Python	04:00 to 05:30	1.5 HOUR
10	24/11/2021	TUSEDAY	Examination /Test	2:30 to 04:00 PM	1.5 HOUR

Department of Information Technology GMR Institute of Technology

SYLLABUS – VALUE ADDED COURSE ON AI and ML APPLICATIONS through Python for SECOND YEAR IT (2021-22) (Section A and B) Students

S.No	Dates	Day	Topics	Time	No. of Hours
1	20/04/2022	WEDNESDAY	AI with Python – Primer Concepts ➤ Basic Concept of Artificial Intelligence (AI) ➤ The Necessity of Learning AI ➤ What is Intelligence ➤ Types of Intelligence ➤ Application of AI	1.00 to 4.00 PM	3 HOUR
2	21/04/2022	THURSDAY	AI with Python – Getting Started ➤ Why Python for AI ➤ Features of Python ➤ Installing Python	1.00 to 4.00 PM	3HOUR
3	22/04/2022	FRIDAY	AI with Python – Machine Learning ➤ Types of Machine Learning (ML) ➤ Most Common Machine Learning Algorithms	1.00 to 4.00 PM	3HOUR
4	23/04/2022	SATURDAY	AI with Python – Data Preparation? ➤ Preprocessing the Data ➤ Techniques for Data Preprocessing	1.00 to 4.00 PM	3HOUR
5	24/04/2022	SUNDAY	Supervised Learning: Classification ➤ Steps for Building a Classifier in Python Supervised Learning: Regression ➤ Building Regressors in Python	1.00 to 4.00 PM	3HOUR
6	25/04/2022	MONDAY	AI with Python – Logic Programming ➤ How to Solve Problems with Logic Programming ➤ Installing Useful Packages	1.00 to 4.00 PM	3HOUR
7	26/04/2022	TUESDAY	Unsupervised Learning: Clustering ➤ What is Clustering?	1.00 to 4.00 PM	3HOUR

			➤ Algorithms for Clustering the Data		
8	27/04/2022	WEDNESDAY	Natural Language Processing ➤ Components of NLP	1.00 to 4.00 PM	3 HOUR
9	28/04/2022	THURSDAY	AI with Python – Speech Recognition ➤ Building a Speech Recognizer	1.00 to 4.00 PM	3 HOUR
10	29/04/2022	FRIDAY	AI with Python – Gaming ➤ Search Algorithms ➤ How it works ➤ Combinational Search ➤ Minimax Algorithm ➤ Alpha-Beta Pruning	1.00to 4.00 PM	3 HOUR

Department of Information Technology

Minimum Credits to be earned: 164 (for Regular Students)

131 (for Lateral Entry Students)

First Semester							
No	Course Code	Course	POs	Contact Hours			
				L	T*	P	C
1	19HSX01	Communicative English	10,12	3	1	-	3
2	19MAX01	Engineering Mathematics I	1,12	3	1	-	3
3	19PYX01 19CYX01	Engineering Physics / Engineering Chemistry	1,12/ 1,12	3	1	-	3
4	19BEX01 19BEX02	Basics of Engineering / Problem Solving and Programming Skills	1,12/ 1,12	3	1	-	3
5	19BEX03 19HSX02	Problem Solving and Programming Skills Laboratory/ Communicative English Laboratory	4/ 10,12	-	-	3	1.5
6	19BEX04 19BEX05	Engineering Drawing / Engineering Workshop	1,5,10/ 1,9,10	-	-	3	1.5
7	19PYX02 19CYX02	Engineering Physics Laboratory / Engineering Chemistry Laboratory	4/ 4	-	-	3	1.5
Total				12	4	9	16.5
Second Semester							
1		Language Elective	10,12	3	1	-	3
2	19MAX02	Engineering Mathematics II	1,12	3	1	-	3
3	19PYX01 19CYX01	Engineering Physics / Engineering Chemistry	1,12/ 1,12	3	1	-	3
4	19BEX01 19BEX02	Basics of Engineering / Problem Solving and Programming Skills	1,12/ 1,12	3	1	-	3
5	19BEX03 19HSX02	Problem Solving and Programming Skills Laboratory/ Communicative English Laboratory	4/ 10,12	-	-	3	1.5
6	19BEX04 19BEX05	Engineering Drawing / Engineering Workshop	1,5,10/ 1,9,10	-	-	3	1.5
7	19PYX02 19CYX02	Engineering Physics Laboratory / Engineering Chemistry Laboratory	4/ 4	-	-	3	1.5
Total				12	4	9	16.5
Third Semester							
1	19CS303	Data Structures	1,2,12	3	1	-	3
2	19CS304	Digital Logic Design	1,3,4	3	-	2	4
3	19CS305	Discrete Mathematical Structures	1,2,12	3	1	-	3
4	19IT304	Database Management Systems	1, 2, 3, 12, PS02	3	1	-	3
5	19IT305	Data Communication Systems	1, 7, 12	3	1	-	3
6	19IT306	Object Oriented Programming through Java	1,2,3,4,5,PS02	3	-	2	4
7	19CS307	Data Structures Laboratory	1,3,4,5	-	-	3	1.5
8	19IT308	Database Management Systems Laboratory	1, 2, 3, 4, 5	-	-	3	1.5
9	19BEA01	Environmental Studies	1, 6, 7, 12	-	-	-	-
10	19IT409	Employability Skills I	1, 2, 5, 8, 10,12	1	1	1	-
11	19HSX11	CC & EC Activities I	6, 7, 9, 10	-	-	1	-
Total				19	5	12	23
Fourth Semester							
1	19MA405	Probability and Statistics	1,2	3	1	-	3
2	19CS403	Computer Organization and Architecture	1,12	3	1	-	3
3	19IT403	Operating Systems	1,2,7,12	3	1	-	3
4	19IT404	Computer Networking	1,2,12	3	1	-	3
5	19IT405	Web Technologies	3, 5, PS01	3	-	2	4
6	19IT406	Python Programming Laboratory	2, 3, 4	-	-	3	1.5
7	19IT407	Operating Systems Laboratory	3, 5, 9	-	-	3	1.5
8	19IT408	Comprehensive Quiz I (Sem. 3 & 4)	-	-	-	-	2

* Hours suggested for tutorials

9	19IT409	Employability Skills I	1, 2, 5, 8, 10, 12	1	1	1	3
10	19HSX11	CC & EC Activities I	6, 7, 9, 10	-	-	1	1
			Total	16	5	10	25
Fifth Semester							
1	19CS404	Design and Analysis of Algorithms	2,3,4,PS01	3	-	2	4
2	19IT502	Artificial Intelligence	1, 12, PS01	3	1	-	3
3	19IT503	Cloud Computing	2, 6, 7, 8	3	1	-	3
4	19IT504	Software Engineering Principles	1,2,3,4,5	3	-	2	4
5		Elective I (Professional Elective)		3	1	-	3
6		Elective II (Open Elective I)		3	1	-	3
7	19IT507	Cloud Computing Lab	4, 5	-	-	3	1.5
8	19IT508	Term Paper	1, 4, 10, 12	-	-	3	1.5
9	19IT609	Employability Skills II	1, 2, 5, 8, 10, 12	1	1	1	-
10	19HSX12	CC & EC Activities II	6, 7, 9, 10	-	-	1	-
11	19IT511	Summer Internship #I	1, 2, 8, 10, 12				1.5
			Total	19	5	12	24.5
Sixth Semester							
1	19HSX10	Engineering Economics and Project Management	10,11,12	3	1	-	3
2	19IT602	Automata and Compiler Design	1,2,3	3	1	-	3
3	19IT603	Machine Learning	2, 5	3	1	-	3
4		Elective III (Professional Elective)		3	-	2	4
5		Elective IV (Open Elective II)		3	1	-	3
6	19IT606	Machine Learning Lab using Python	3, 5, 9	-	-	3	1.5
7	19IT607	Mini Project	All	-	-	3	1.5
8	19IT608	Comprehensive Quiz II (Sem. 5 & 6)		-	-	-	2
9	19IT609	Employability Skills II	1, 2, 5, 8, 10, 12	1	1	1	3
10	19HSX12	CC & EC Activities II	6, 7, 9, 10	-	-	1	1
11		Audit Course	PO12	-	-	-	-
			Total	16	5	8	25
Seventh Semester							
1		Elective V (Professional Elective)		3	1	-	3
2		Elective VI (Professional Elective)		3	1	-	3
3		Elective VII (Open Elective III)		3	1	-	3
4	19IT701	Project	All	-	-	16	8
5	19IT702	Summer Internship #II	1, 2,5,6, 10, 12	-	-	-	1.5
			Total	9	3	16	18.5
Eighth Semester							
1		Elective VIII (Professional Elective)		-	-	-	3
2		Elective IX (Open Elective IV)		-	-	-	3
3	19IT801	Full Semester Internship (FSI)	1, 2, 5, 8, 9,10, PS01,PS02	-	-	-	9
			Total	-	-	-	15

List of Electives

Language Electives							
No.	Course Code	Course	POs	Contact Hours			
				L	T	P	C
1	19HSX03	Advanced Communicative English	10,12	3	1	-	3
2	19HSX04	Communicative German		3	1	-	3
3	19HSX05	Communicative French		3	1	-	3
4	19HSX06	Communicative Japanese		3	1	-	3
5	19HSX07	Communicative Spanish		3	1	-	3
6	19HSX08	Communicative Korean		3	1	-	3
7	19HSX09	Communicative Hindi		3	1	-	3
Elective I							
Career Path I, II, III and Other Core Electives							
1	19CSC11	Exploratory Data Analytics (AI&ML)	1, 4, 12	3	1	-	3
2	19CSC21	Web Programming Languages (Full Stack Development)	1, 2, 7, 12	3	1	-	3
3	19ITC31	Fundamentals of Security (Cyber Security)	1, 2, 5	3	1	-	3
4	19IT004	Computer Graphics and Multimedia	2, 3, 5	3	1	-	3
5	19IT005	Information Theory and Coding	1,2,3,6,8	3	1	-	3
6	19IT006	Data Warehousing and Data Mining	2, 3, 4, 5, PSO1	3	1	-	3
7		MOOCs		-	-	-	3
Elective II:Open Elective I							
1	19CE001	Disaster Management	2, 7	3	1	-	3
2	19EE001	Electrical Installation, Safety and Auditing	2, 3, 6, 8,	3	1	-	3
3	19ME001	Fundamentals of Optimization Techniques	1, 2	3	1	-	3
4	19EC001	Sensors for Engineering Applications	1,	3	1	-	3
5	19CS001	Fundamentals of Artificial Intelligence	1, 2, 3	3	1	-	3
6	19CH001	Energy Conversion and Storage Devices	1, 3, 6, 7	3	1	-	3
7	19IT001	Fundamentals of Multimedia	1, 5, 7	3	1	-	3
8	19BS001	Nano Materials and Technology	1, 12	3	1	-	3
Elective III							
Career Path I, II, III and Other Core Electives							
1	19CSC12	Deep Learning (AI&ML)	1,2,4,12, PSO1	3	-	2	4
2	19CSC22	Web Application Developments Framework (Full Stack Development)	1, 3, 4	3	-	2	4
3	19ITC32	Cyber Security (Cyber Security)	1, 3,4,12,PSO1	3	-	2	4
4	19IT007	The Internet of Things	1, 2, 3, 5, 10	3	-	2	4
5	19IT008	Cryptogaphy and Network Security	5, 6, 8	3	-	2	4
6	19IT009	User Interface/ User Experience	1, 2, 3, 5, 10	3	-	2	4
Elective IV : Open Eletive II							
1	19CE002	Air Pollution and Environmental Impact Assessment	6, 7, 12	3	1	-	3
2	19EE002	Renewable Energy Souces	2, 7	3	1	-	3
3	19ME002	Principles of Entrepreneurship	1, 11	3	1	-	3
4	19EC002	Electronics for Agriculture	1, 2	3	1	-	3
5	19CS002	Fundamentals of Machine Learning	2, 5	3	1	-	3
6	19CH002	Industrial Safety and Hazard Management	1, 2, 3, 6, 8	3	1	-	3
7	19IT002	Fundamentals of Cloud Computing	1,7	3	1	-	3
8	19BS002	Advancd Numerical Techniques	1, 2	3	1	-	3
9	19BS003	Functional Materials and Applications	1,7	3	1	-	3
Elective V							
Career Path I, II, III and Other Core Electives							
1	19CSC13	Natural Language Processing (AI & ML)	2,3	3	1	-	3
2	19CSC23	Web Application Databases (Full Stack Development)	3,5	3	1	-	3
3	19ITC33	Cloud Security (Cyber Security)	2,3,5	3	1	-	3
4	19EC602	Digital Signal Processing	1,2, PSO2	3	1	-	3

5	19IT010	Information Retrieval Systems	3,6,8	3	1	-	3
6	19CS005	Mobile Computing	3, 5,8	3	1	-	3
7		MOOCs		-	-	-	3
Elective VI							
1	19IT010	Social Network Analysis	2,4,5,12	3	1	-	3
2	19IT011	Real Time Operating Systems	2,3,12	3	1	-	3
3	19IT012	Digital Image Processing	3,5,6	3	1	-	3
4	19IT014	Distributed Systems	2, 7, 12	3	1	-	3
5	19CS012	Wireless Ad hoc Networks	3, 5, 6, 12	3	1	-	3
6	19CS015	Software Project Management	3, 5, 6, 12	3	1	-	3
7		MOOCs		-	-	-	3
Elective VII: Open Elective III							
1	19CE003	Solid Waste Management	3, 7, 12	3	1	-	3
2	19EE003	Fundamentals of Electrical Vehicle Technology	2, 3, 12	3	1	-	3
3	19ME003	Industrial Engineering and Management	1, 11	3	1	-	3
4	19EC003	Interfacing and Programming with Arduino	1,2	3	1	-	3
5	19CS003	Data Science for Engineering Applications	2, 3, 4	3	1	-	3
6	19CH003	Industrial Ecology for Sustainable Development	2, 6, 7	3	1	-	3
7	19IT003	Fundamentals of Mobile Computing	1,7	3	1	-	3
8	19BS004	Advanced Materials of Renewable Energy	1,7	3	1	-	3
9	19BS005	Applied Linear Algebra for Engineers	1,12	3	1	-	3
Elective VIII: Professional Elective							
1	19CS014	Green Computing	3, 6, 8	-	-	-	3
1	19IT013	Design Patterns	2,3,5	-	-	-	3
3	19IT016	Professional Ethics	6,8	-	-	-	3
4		MOOCs		-	-	-	3
Elective IX: Open Elective IV							
1	19CE019	Green Buildings	1, 7, 12	-	-	-	3
2	19EE017	Sustainable Energy	1, 2,12, PS02	-	-	-	3
3	19ME019	Total Quality Management	1,11	-	-	-	3
4	19EC011	Communication Technologies	1,2	-	-	-	3
5	19CS020	Applications of Artificial Intelligence	2,3,6,7	-	-	-	3
6	19CH016	Green Technologies	1,6,7	-	-	-	3
7	19IT015	Human Computer Interaction	1,7	-	-	-	3
8	19BS006	Handling of Industrial Waste and Waste Water	1,7	-	-	-	3
Audit Course							
1	19AT001	Communication Etiquette in Workplaces					
2	19AT002	Contemporary India: Economy, Policy and Society					
3	19AT003	Design The Thinking					
4	19AT004	Ethics and Integrity					
5	19AT005	Indian Heritage and Culture					
6	19AT006	Human Values and Professional Ethics					
7	19AT007	Intellectual Property Rights					
8	19AT008	Introduction to Journalism					
9	19AT009	Mass Media Communication					
10	19AT010	Science, Technology and Development					
11	19AT011	Social Responsibility					
12	19AT012	The Art of Photography and Film Making					
13	19AT013	Gender Equality for Sustainability					
14	19AT014	Women in Leadership					
15	19AT015	Introduction to Research Methodology					
16	19AT016	Climatic Change and Circular Economy					
B. Tech. (Honors)							
Domain – I: Modern Computing							
01	19ITH11	Advanced Computer Architecture	2, 3	4	-	-	4
02	19ITH12	Micro Processors and Micro Controllers	2, 3	4	-	-	4
03	19ITH13	Embedded Systems	1, 2, 7,12	4	-	-	4
04	19ITH14	High Performance Computing	2, 3	4	-	-	4
Domain – II: Data Engineering							

01	19CSH11	Advanced Data Structures	2, 3, 4	4	-	-	4
02	19CSH12	Advanced Databases	2, 3, 4	4	-	-	4
03	19CSH13	Programming, Data Structures and Algorithms Using Python	2, 3, 4, 5	4	-	-	4
04	19CSH14	Bio-Informatics	1, 2, 5	4	-	-	4
Domain – III: Modern Software Engineering							
01	19CSH21	DevOps	1, 3, 5, 8, 10	4	-	-	4
02	19CSH22	Design Patterns	2, 3, 5	4	-	-	4
03	19CSH23	Advanced Software Engineering	1, 2, 3, 4, PS01	4	-	-	4
04	19CSH24	Robotic Process Automation	3, 5, 8, PS02	4	-	-	4
Domain – IV: Security							
01	19CSH31	Fundamentals of Systems Security	1, 2	4	-	-	4
02	19CSH32	Python Programming for Security	1, 3, 4	4	-	-	4
03	19CSH33	Management of Information Security	3, 6, 7	4	-	-	4
04	19CSH34	Computer Forensics	2, 3, 5	4	-	-	4
B. Tech. (Minors)							
Energy Science & Technology							
1	19CHM11	Foundation of Energy Science and Technology	1, 2, 3, 5, 7, 12	4	-	-	4
2	19CHM12	Energy Generation from Waste	1, 2, 3, 4, 5	4	-	-	4
3	19CHM13	Energy Storage Systems	1, 2, 3, 6, 7	4	-	-	4
4	19CHM14	Hydrogen Energy and Fuel Cells	1, 2, 3, 7	4	-	-	4
Nano Science & Technology							
5	19CHM21	Introduction and Characterization of Nano Materials	1, 2, 3, 7	4	-	-	4
6	19CHM22	Carbon Nanostructures and Applications	1, 3, 4, 5	4	-	-	4
7	19CHM23	Energy, Environment & Biomedical Nanotechnology	1, 2, 3, 7	4	-	-	4
8	19CHM24	Industrial Applications of Nano Technology	2, 3, 5, 7	4	-	-	4
Environmental Engineering							
9	19CEM11	Watershed Management	6,7	4	-	-	4
10	19CEM12	Industrial Pollution Control and Engineering	3,6,7	4	-	-	4
11	19CEM13	Solid and Hazardous Waste Management	1,3,6,7	4	-	-	4
12	19CEM14	Ecology and Environmental Assessment	1,3,6,7	4	-	-	4
Artificial Intelligence & Machine Learning							
13	19CSM11	Fundamentals of AI & Machine Learning	1,12	4	-	-	4
14	19CSM12	Feature Engineering for Machine Learning	1,2,3	4	-	-	4
15	19CSM13	Exploratory Data Analytics	1,4	4	-	-	4
16	19CSM14	Deep Learning	1,2, 4	4	-	-	4
Cyber Security							
17	19CSM21	Fundamentals of Security	1,2	4	-	-	4
18	19CSM22	Management of Information Security	3,6,7	4	-	-	4
19	19CSM23	Cyber Security	1,3,4	4	-	-	4
20	19CSM24	Cloud Security	2,3	4	-	-	4
Data Science & Analytics							
21	19CSM31	Data Cleaning	2,3,4	4	-	-	4
22	19CSM32	Data Engineering	1,2,3,4	4	-	-	4
23	19CSM33	Text Analytics	1,2,4	4	-	-	4
24	19CSM34	Social Network and Semantic Analysis	2, 4	4	-	-	4
Computer Systems Programming							
25	19CSM41	Programming Fundamentals	1,2,3	4	-	-	4
26	19CSM42	Data Structures & Algorithms	1,2,3,4	4	-	-	4
27	19CSM43	Fundamentals of Databases	1,4	4	-	-	4
28	19CSM44	Fundamentals of Computer Networks & Operating Systems	1,2,3	4	-	-	4
Digital IC Design							
29	19ECM11	Fundamentals of VLSI Design	1, 2, 3	4	-	-	4
30	19ECM12	Digital Design using HDL	1, 2, 3	4	-	-	4

31	19ECM13	FPGA Technology	1, 2	4	-	-	4
32	19ECM14	Analog and Mixed Signal Design	1, 2	4	-	-	4
Industrial Automation							
33	19ECM21	Microcontrollers and Interfacing	1, 2, 3	4	-	-	4
34	19ECM22	Sensors and Data Acquisition System	1, 2	4	-	-	4
35	19ECM23	Fundamentals of Labview	1, 2	4	-	-	4
36	19ECM24	Medical Robotics	1, 2, 3	4	-	-	4
Communications and Networking							
37	19ECM31	Principles of Communications	1, 2	4	-	-	4
38	19ECM32	Coding Theory and Practice	1, 2	4	-	-	4
39	19ECM33	Ad-hoc and Wireless Sensor Networks	1, 2, 3	4	-	-	4
40	19ECM34	Fundamentals of Multimedia Networking	1, 2, 3	4	-	-	4

Avionics							
41	19ECM41	Principles of Aerodynamics	1, 2	4	-	-	4
42	19ECM42	Aircraft Electrical Systems	1, 2	4	-	-	4
43	19ECM43	Aircraft Instrument Systems	1, 2	4	-	-	4
44	19ECM44	Aircraft Communication and Navigational Systems	1, 2	4	-	-	4
Geographic Information System							
45	19ECM51	Sensors and Sensing Technology	1, 2	4	-	-	4
46	19ECM52	Geographic Information Systems	1, 2	4	-	-	4
47	19ECM53	Digital Image Processing	1, 2	4	-	-	4
48	19ECM54	Lidar Systems	1, 2	4	-	-	4
Electric Vehicles Technology							
49	19EEM11	Introduction to Electric Vehicles Technologies	2, 3	4	-	-	4
50	19EEM12	Electrical Drives and Controllers for Electric Vehicles	2, 3	4	-	-	4
51	19EEM13	Charging Technology in Electric Vehicles	2, 3	4	-	-	4
52	19EEM14	Computer Vision in Electric Vehicles	2, 3	4	-	-	4
Smart City Management							
53	19EEM21	Fundamentals of Smart City	2, 3	4	-	-	4
54	19EEM22	Smart City Infrastructure	2, 3, 5, 6, 7, 11	4	-	-	4
55	19EEM23	Computational Methods for Smart City Management	3, 5	4	-	-	4
56	19EEM24	Communication Technologies and Mobility for Smart City	2, 3	4	-	-	4
Industrial Applications and Control							
57	19EEM31	Modelling and Simulations of Industrial Applications	2, 3	4	-	-	4
58	19EEM32	Industrial Sensors and Actuators	2, 3	4	-	-	4
59	19EEM33	Programmable Logic Controllers	2, 3	4	-	-	4
60	19EEM34	Control Design for Industrial Applications	2, 3	4	-	-	4
Robotics and Automation							
61	19MEM11	Introduction to Robotics	1,2,3	4	-	-	4
62	19MEM12	Drives and Sensors	1,2,3,4	4	-	-	4
63	19MEM13	Control Systems for Robotics	1,2,3,4	4	-	-	4
64	19MEM14	Machine Learning for Robotics	2,5	4	-	-	4
Industrial Systems Engineering							
65	19MEM21	Industrial Management	1,10,11,12	4	-	-	4
66	19MEM22	Fundamentals of Operations Research	1,2,3,5	4	-	-	4
67	19MEM23	Enterprise Resource Planning	1,2,3,5,11,12	4	-	-	4
68	19MEM24	Production Planning and Control	1,2,3,5,11,12	4	-	-	4

Department of Information Technology
 Minimum Credits to be earned: 160 (for Regular Students)
 127 (for Lateral Entry Students)

First Semester							
No	Course Code	Course	POs	Contact Hours			
				L	T*	P	C
1	20HSX01	Communicative English	10,12	3	-	-	3
2	20MAX01	Engineering Mathematics I	1,12	3	1	-	3
3	20PYX01 20CYX01	Engineering Physics / Engineering Chemistry	1,12/ 1,12	3	1	-	3
4	20BEX01 20BEX02	Basics of Engineering / Problem Solving and Programming Skills	1,12/ 1,12	3	1	-	3
5	20BEX03 20HSX02	Problem Solving and Programming Skills Laboratory/ Communicative English Laboratory	4/ 10,12	-	-	3	1.5
6	20BEX04 20BEX05	Engineering Drawing / Engineering Workshop	1,5,10/ 1,9,10	-	-	3	1.5
7	20PYX02 20CYX02	Engineering Physics Laboratory / Engineering Chemistry Laboratory	4/4	-	-	3	1.5
Total				12	3	9	16.5
Second Semester							
1		Language Elective	10,12	3	-	-	3
2	20MAX02	Engineering Mathematics II	1,12	3	1	-	3
3	20PYX01 20CYX01	Engineering Physics / Engineering Chemistry	1,12/ 1,12	3	1	-	3
4	20BEX01 20BEX02	Basics of Engineering / Problem Solving and Programming Skills	1,12/ 1,12	3	1	-	3
5	20BEX03 20HSX02	Problem Solving and Programming Skills Laboratory/ Communicative English Laboratory	4/ 10,12	-	-	3	1.5
6	20BEX04 20BEX05	Engineering Drawing / Engineering Workshop	1,5,10/ 1,9,10	-	-	3	1.5
7	20PYX02 20CYX02	Engineering Physics Laboratory / Engineering Chemistry Laboratory	4/4	-	-	3	1.5
Total				12	3	9	16.5
Third Semester							
1	20CS303	Data Structures	1,2,3,12	3	1	-	3
2	20CS304	Digital Logic Design	1,3,4	3	-	2	4
3	20CS305	Discrete Mathematical Structures	1,2,12	3	1	-	3
4	20IT304	Database Management Systems	1, 2, 3, 12, PS02	3	1	-	3
5	20IT305	Data Communication Systems	1, 7, 12	3	1	-	3
6	20IT306	Object Oriented Programming through Java	1,2,3,4,5,PS02	3	-	2	4
7	20CS307	Data Structures Laboratory	1,3,4,5	-	-	3	1.5
8	20IT308	Database Management Systems Laboratory	1, 2, 3, 4, 5	-	-	3	1.5
9	20BEA01	Environmental Studies	1, 7	-	-	-	-
10	20IT408	Employability Skills I	1, 6, 8, 10, 12	1	1	1	-
11	20HSX11	CC & EC Activities I	6, 7, 9, 10	-	-	1	-
Total				18	5	12	23
Fourth Semester							
1	20MA405	Probability and Statistics	1,2	3	1	-	3
2	20CS403	Computer Organization and Architecture	1,2, 12	3	1	-	3

* Hours suggested for tutorials

3	20IT403	Operating Systems	1,2,7,12	3	1	-	3
4	20IT404	Computer Networking	1,2,12	3	1	-	3
5	20IT405	Web Technologies	3, 5, PS01	3	-	2	4
6	20IT406	Python Programming Laboratory	2, 3, 4	-	-	3	1.5
7	20IT407	Operating Systems Laboratory	3, 5, 9	-	-	3	1.5
8	20IT408	Employability Skills II	1, 6, 8, 10, 12	1	1	1	3
9	20HSX11	CC & EC Activities I	6, 7, 9, 10	-	-	1	1
			Total	15	4	10	23
Fifth Semester							
1	20CS404	Design and Analysis of Algorithms	2,3,4,PS01	3	-	2	4
2	20IT502	Artificial Intelligence	1, 12, PS01	3	1	-	3
3	20IT503	Cloud Computing	2, 6, 7, 8	3	1	-	3
4	20IT504	Software Engineering Principles	1,2,3,4,5	3	-	2	4
5		Elective I (Professional Elective)		3	1	-	3
6		Elective II (Open Elective I)		3	-	-	3
7	20IT507	Cloud Computing Lab	4, 5	-	-	3	1.5
8	20IT508	Term Paper	1, 4, 10, 12	-	-	3	1.5
9	20IT608	Employability Skills III	1, 6, 8, 10, 12	1	1	1	-
10	20HSX12	CC & EC Activities II	6, 8, 9, 10	-	-	1	-
11	20IT511	Summer Internship #I	1, 2, 8, 10, 12				1.5
			Total	18	4	12	24.5
Sixth Semester							
1	20HSX10	Engineering Economics and Project Management	10,11,12	3	1	-	3
2	20IT602	Automata and Compiler Design	1,2,3	3	1	-	3
3	20IT603	Machine Learning	2, 5	3	1	-	3
4		Elective III (Professional Elective)		3	1	-	4
5		Elective IV (Open Elective II)		3	-	-	3
6	20IT606	Machine Learning Lab using Python	3, 5, 9	-	-	3	1.5
7	20IT607	Mini Project	1, 2,3,4,5, 6, 7, 8, 9, 10, 11, 12	-	-	3	1.5
8	20IT608	Employability Skills IV	1, 6, 8, 10, 12	-	1	1	3
9	20HSX12	CC & EC Activities II	6, 7, 9, 10	-	-	1	1
10		Audit Course	PO12	-	-	-	-
			Total	15	4	8	23
Seventh Semester							
1		Elective V (Professional Elective) ¹		3	1	-	3
2		Elective VI (Professional Elective)		3	1	-	3
3		Elective VII (Open Elective III)		3	1	-	3
4	20IT704	Project	1, 2,3,4,5, 6, 7, 8, 9, 10, 11, 12	-	-	16	8
5	20IT705	Summer Internship #II	1, 2, 8, 10, 12	-	-	-	1.5
			Total	9	-	16	18.5
Eighth Semester							
1		Elective VIII (Professional Elective)		3	1	-	3
2		Elective IX (Open Elective IV)		3	1	-	3
3	20IT803	Full Semester Internship (FSI)	1, 2, 5, 8, 9,10, PS01,PS02	-	-	-	9
			Total	6	-	-	15

List of Electives

Language Electives							
No.	Course Code	Course	POs	Contact Hours			
				L	T	P	C
1	20HSX03	Advanced Communicative English	10,12	3	-	-	3
2	20HSX04	Communicative German		3	-	-	3
3	20HSX05	Communicative French		3	-	-	3
4	20HSX06	Communicative Japanese		3	-	-	3
5	20HSX07	Communicative Spanish		3	-	-	3
6	20HSX08	Communicative Korean		3	-	-	3
7	20HSX09	Communicative Hindi		3	-	-	3
Elective I							
Career Path I, II, III and Other Core Electives							
1	20CSC11	Exploratory Data Analytics (AI&ML)	1, 4, 12	3	1	-	3
2	20CSC21	Web Programming Languages (Full Stack Development)	1, 2, 7, 12	3	1	-	3
3	20ITC31	Fundamentals of Security (Cyber Security)	1,2, 5	3	1	-	3
4	20IT004	Computer Graphics and Multimedia	2, 3, 5	3	1	-	3
5	20IT005	Information Theory and Coding	1,2,3,6,8	3	1	-	3
6	20IT006	Data Warehousing and Data Mining	2, 3, 4, 5, PSO1	3	1	-	3
7		MOOCs		-	-	-	3
Elective II:Open Elective I							
1	20CE001	Disaster Management	2, 7	3	1	-	3
2	20EE001	Electrical Installation, Safety and Auditing	2, 3, 6, 8	3	1	-	3
3	20ME001	Fundamentals of Optimization Techniques	1, 2, 3, 5	3	1	-	3
4	20EC001	Sensors for Engineering Applications	1	3	1	-	3
5	20CS001	Fundamentals of Artificial Intelligence	1, 2, 3	3	1	-	3
6	20CH001	Energy Conversion and Storage Devices	1, 3, 6, 7	3	1	-	3
7	20IT001	Fundamentals of Multimedia	3, 5, 7	3	1	-	3
8	20BS001	Nano Materials and Technology	1,12	3	1	-	3
Elective III							
Career Path I, II, III and Other Core Electives							
1	20CSC12	Deep Learning (AI & ML)	1, 2, 4, 12, PSO1	3	-	2	4
2	20CSC22	Web Application Developments Framework (Full Stack Development)	1, 3, 4	3	-	2	4
3	20ITC32	Cyber Security (Cyber Security)	1, 3, 4, 12, PSO1	3	-	2	4
4	19IT007	The Internet of Things	1, 2, 5, 10	3	-	2	4
5	19IT008	Information Retrieval Systems	3,6,8	4	-	-	4
6	19IT009	User Interface/ User Experience	1, 2, 3, 5, 10	4	-	-	4
7		MOOCs		-	-	-	4
Elective IV : Open Elective II							
1	20CE002	Air Pollution and Environmental Impact Assessment	6, 7, 12	3	1	-	3
2	20EE002	Renewable Energy Souces	2, 7	3	1	-	3
3	20ME002	Principles of Entrepreneurship	1, 5, 8, 11	3	1	-	3
4	20EC002	Electronics for Agriculture	1, 2	3	1	-	3
5	20CS002	Machine Learning	2, 5	3	1	-	3
6	20CH002	Industrial Safety and Hazard Management	1, 2, 3, 6, 8	3	1	-	3
7	20IT002	Fundamentals of Cloud Computing	2, 6, 7, 8, 12	3	1	-	3
8	20BS002	Advancd Numerical Techniques	1, 2	3	1	-	3
Elective V							
Career Path I, II, III and Other Core Electives							
1	20CSC13	Natural Language Processing (AI & ML)	2,3	3	1	-	3
2	20CSC23	Web Application Databases (Full Stack Development)	3,5	3	1	-	3
3	20ITC33	Cloud Security (Cyber Security)	2,3,5	3	1	-	3
4	20EC602	Digital Signal Processing	1,2, PSO2	3	1	-	3
5	20CS008	Cryptogaphy and Network Security	5, 6, 8	3	1	-	3

6	20CS005	Mobile Computing	3, 5, 8	3	1	-	3
7		MOOCs		-	-	-	3
Elective VI							
1	20IT010	Social Network Analysis	2,4,5,12	3	1	-	3
2	20IT011	Real Time Operating Systems	2,3,12	3	1	-	3
3	20IT012	Digital Image Processing	3,5,6	3	1	-	3
4	20IT007	Distributed Systems	2, 7, 12	3	1	-	3
5	20CS012	Wireless Ad hoc Networks	3, 5, 6, 12	3	1	-	3
6	20CS015	Software Project Management	3, 5, 6, 12	3	1	-	3
7		MOOCs		-	-	-	3
Elective VII: Open Elective III							
1	20CE003	Solid Waste Management	2, 3, 12	3	1	-	3
2	20EE003	Sustainable Energy	6, 7, 12	3	1	-	3
3	20ME003	Industrial Engineering and Management	1, 10, 11, 12	3	1	-	3
4	20EC003	Modern Communication Systems	1,12	3	1	-	3
5	20CS003	Data Science for Engineering Applications	2, 3	3	1	-	3
6	20CH003	Industrial Ecology for Sustainable Development	6, 7	3	1	-	3
7	20IT003	Fundamentals of Mobile Computing	2, 3, 5, 12	3	1	-	3
8	20BS003	Functional Materials and Applications	1, 4	3	1	-	3
Audit Course							
1	20AT001	Communication Etiquette in Workplaces					
2	20AT002	Contemporary India: Economy, Policy and Society					
3	20AT003	Design The Thinking					
4	20AT004	Ethics and Integrity					
5	20AT005	Indian Heritage and Culture					
6	20AT006	Human Values and Professional Ethics					
7	20AT007	Intellectual Property Rights and Patents					
8	20AT008	Introduction to Journalism					
9	20AT009	Mass Media Communication					
10	20AT010	Science, Technology and Development					
11	20AT011	Social Responsibility					
12	20AT012	The Art of Photography and Film Making					
13	20AT013	Gender Equality for Sustainability					
14	20AT014	Women in Leadership					
15	20AT015	Introduction to Research Methodology					
16	20AT016	Climatic Change and Circular Economy					
B. Tech. (Honors)							
Domain – I: Modern Computing							
01	20ITH11	Advanced Computer Architecture	2, 3	4	-	-	4
02	20ITH12	Micro Processors and Micro Controllers	2, 3	4	-	-	4
03	20CSH13	Embedded Systems	1, 2, 7,12	4	-	-	4
04	20CSH14	High Performance Computing	2, 3	4	-	-	4
Domain – II: Data Engineering							
01	20CSH11	Advanced Data Structures	2, 3, 4	4	-	-	4
02	20CSH12	Advanced Databases	2, 3, 4	4	-	-	4
03	20CSH13	Programming, Data Structures and Algorithms Using Python	2, 3, 4, 5	4	-	-	4
04	20CSH14	Bio-Informatics		4	-	-	4
Domain – III: Modern Software Engineering							
01	20CSH21	DevOps	1, 3, 5, 8, 10	4	-	-	4
02	20CSH22	Design Patterns	2, 3, 5	4	-	-	4
03	20CSH23	Advanced Software Engineering	1, 2, 3, 4, PSO1	4	-	-	4
04	20CSH24	Robotic Process Automation		4	-	-	4
Domain – IV: Security							
01	20CSH31	Fundamentals of Systems Security	1, 2	4	-	-	4
02	20CSH32	Python Programming for Security	1, 3, 4	4	-	-	4
03	20CSH33	Management of Information Security	3, 6, 7	4	-	-	4
04	20CSH34	Computer Forensics		4	-	-	4

B. Tech. (Minors)							
Energy Science & Technology							
1	20CHM11	Foundation of Energy Science and Technology	1, 2, 3, 5, 7, 12	4	-	-	4
2	20CHM12	Energy Generation from Waste	1, 2, 3, 4, 5	4	-	-	4
3	20CHM13	Energy Storage Systems	1, 2, 3, 6, 7	4	-	-	4
4	20CHM14	Hydrogen Energy and Fuel Cells	1, 2, 3, 7	4	-	-	4
Nano Science & Technology							
5	20CHM21	Introduction and Characterization of Nano Materials	1, 2, 3, 7	4	-	-	4
6	20CHM22	Carbon Nanostructures and Applications	1, 3, 4, 5	4	-	-	4
7	20CHM23	Energy, Environment & Biomedical Nanotechnology	1, 2, 3, 7	4	-	-	4
8	20CHM24	Industrial Applications of Nano Technology	2, 3, 5, 7	4	-	-	4
Environmental Engineering							
9	20CEM11	Watershed Management	6,7	4	-	-	4
10	20CEM12	Industrial Pollution Control and Engineering	3,6,7	4	-	-	4
11	20CEM13	Solid and Hazardous Waste Management	1,3,6,7	4	-	-	4
12	20CEM14	Ecology and Environmental Assessment	1,3,6,7	4	-	-	4
Artificial Intelligence & Machine Learning							
13	20CSM11	Fundamentals of AI & Machine Learning	1,12	4	-	-	4
14	20CSM12	Feature Engineering for Machine Learning	1,2,3	4	-	-	4
15	20CSM13	Exploratory Data Analytics	1,4	4	-	-	4
16	20CSM14	Deep Learning	1, 2, 4	4	-	-	4
Cyber Security							
17	20CSM21	Fundamentals of Security	1,2	4	-	-	4
18	20CSM22	Management of Information Security	3,6,7	4	-	-	4
19	20CSM23	Cyber Security	1,3,4	4	-	-	4
20	20CSM24	Cloud Security	2,3	4	-	-	4
Data Science & Analytics							
21	20CSM31	Data Cleaning	2,3,4	4	-	-	4
22	20CSM32	Data Engineering	1,2,3,4	4	-	-	4
23	20CSM33	Text Analytics	1,2,4	4	-	-	4
24	20CSM34	Social Network and Semantic Analysis	2, 4	4	-	-	4
Computer Systems Programming							
25	20CSM41	Programming Fundamentals	1,2,3	4	-	-	4
26	20CSM42	Data Structures & Algorithms	1,2,3,4	4	-	-	4
27	20CSM43	Fundamentals of Databases	1,4	4	-	-	4
28	20CSM44	Fundamentals of Computer Networks & Operating Systems	1,2,3	4	-	-	4
Digital IC Design							
29	20ECM11	Fundamentals of VLSI Design	1, 2, 3	4	-	-	4
30	20ECM12	Digital Design using HDL	1, 2, 3	4	-	-	4
31	20ECM13	FPGA Technology	1, 2	4	-	-	4
32	20ECM14	Analog and Mixed Signal Design	1, 2	4	-	-	4
Industrial Automation							
33	20ECM21	Microcontrollers and Interfacing	1, 2, 3	4	-	-	4
34	20ECM22	Sensors and Data Acquisition System	1, 2	4	-	-	4
35	20ECM23	Fundamentals of Labview	1, 2	4	-	-	4
36	20ECM24	Medical Robotics	1, 2, 3	4	-	-	4
Communications and Networking							
37	20ECM31	Principles of Communications	1, 2	4	-	-	4
38	20ECM32	Coding Theory and Practice	1, 2	4	-	-	4
39	20ECM33	Ad-hoc and Wireless Sensor Networks	1, 2, 3	4	-	-	4
40	20ECM34	Fundamentals of Multimedia Networking	1, 2, 3	4	-	-	4
Avionics							
41	20ECM41	Principles of Aerodynamics	1, 2	4	-	-	4
42	20ECM42	Aircraft Electrical Systems	1, 2	4	-	-	4
43	20ECM43	Aircraft Instrument Systems	1, 2	4	-	-	4
44	20ECM44	Aircraft Communication and Navigational	1, 2	4	-	-	4

		Systems					
Geographic Information System							
45	20ECM51	Sensors and Sensing Technology	1, 2	4	-	-	4
46	20ECM52	Geographic Information Systems	1, 2	4	-	-	4
47	20ECM53	Digital Image Processing	1, 2	4	-	-	4
48	20ECM54	Lidar Systems	1, 2	4	-	-	4
Electric Vehicles Technology							
49	20EEM11	Introduction to Electric Vehicles Technologies	2, 3	4	-	-	4
50	20EEM12	Electrical Drives and Controllers for Electric Vehicles	2, 3	4	-	-	4
51	20EEM13	Charging Technology in Electric Vehicles	2, 3	4	-	-	4
52	20EEM14	Computer Vision in Electric Vehicles	2, 3	4	-	-	4
Smart City Management							
53	20EEM21	Fundamentals of Smart City	2, 3	4	-	-	4
54	20EEM22	Smart City Infrastructure	2, 3, 5, 6, 7, 11	4	-	-	4
55	20EEM23	Computational Methods for Smart City Management	3, 5	4	-	-	4
56	20EEM24	Communication Technologies and Mobility for Smart City	2, 3	4	-	-	4
Industrial Applications and Control							
57	20EEM31	Modelling and Simulations of Industrial Applications	2, 3	4	-	-	4
58	20EEM32	Industrial Sensors and Actuators	2, 3	4	-	-	4
59	20EEM33	Programmable Logic Controllers	2, 3	4	-	-	4
60	20EEM34	Control Design for Industrial Applications	2, 3	4	-	-	4
Robotics and Automation							
61	20MEM11	Introduction to Robotics	1,2,3	4	-	-	4
62	20MEM12	Drives and Sensors	1,2,3,4	4	-	-	4
63	20MEM13	Control Systems for Robotics	1,2,3,4	4	-	-	4
64	20MEM14	Machine Learning for Robotics	2,5	4	-	-	4
Industrial Systems Engineering							
65	20MEM21	Industrial Management	1,10,11,12	4	-	-	4
66	20MEM22	Fundamentals of Operations Research	1,2,3,5	4	-	-	4
67	20MEM23	Enterprise Resource Planning	1,2,3,5,11,12	4	-	-	4
68	20MEM24	Production Planning and Control	1,2,3,5,11,12	4	-	-	4