

Curriculum for Undergraduate Degree (B.Tech.) in Computer Science and Engineering (Data Science) (w.e.f. AY: 2020-21)

Part II: Course Structure & Semester wise Credit Distribution

First Semester (First Year)							
Mandatory Induction Program- 3 Weeks Duration							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	BS	BS-CH101	Chemistry	3	1	0	4
2	BS	BS-M101	Mathematics-I	3	1	0	4
3	ES	ES-CS101	Programming for Problem Solving	3	0	0	3
<i>Total Theory</i>				9	2	0	11
Practical/ Sessional/ Mandatory Course							
1	BS	BS-CH191	Chemistry Laboratory	0	0	3	1.5
2	ES	ES-CS191	Programming for Problem Solving Laboratory	0	0	4	2
3	ES	ES-ME192	Workshop/Manufacturing Practices	1	0	4	3
4	HM	HM-HU191	Language Laboratory	0	0	2	1
<i>Total Practical/ Sessional/ Mandatory Course</i>				1	0	13	7.5
Total of First Semester				10	2	13	18.5

Second Semester (First Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	BS	BS-PH201	Physics	3	1	0	4
2	BS	BS-M201	Mathematics-II	3	1	0	4
3	ES	ES-EE201	Basic Electrical and Electronics Engineering	3	1	0	4
4	HM	HM-HU201	English	2	0	0	2
<i>Total Theory</i>				11	3	0	14
Practical/ Sessional/ Mandatory Course							
1	BS	BS-PH291	Physics Laboratory	0	0	3	1.5
2	ES	ES-EE291	Basic Electrical and Electronics Engineering Laboratory	0	0	4	2
3	ES	ES-ME291	Engineering Graphics & Design	1	0	4	3
<i>Total Practical/ Sessional/ Mandatory Course</i>				1	0	11	6.5
Total of Second Semester				13	2	11	20.5

Third Semester (Second Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	ES	ES-EC(D)301	Communication Engineering	2	0	0	2
2	ES	ES-EC302	Digital Electronics	3	0	0	3
3	BS	BS-M301	Mathematics III	3	0	0	3
4	PC	PC-CS301	Data Structures and Algorithms	3	0	0	3
5	HM	HM-HU301	Introduction to Industrial Management	2	0	0	2
6	BS	BS-BIO301	Biology	2	0	0	2
<i>Total Theory</i>				15	0	0	15
Practical/ Sessional/ Mandatory Course							
1	ES	ES-EC392	Digital Electronics Lab	0	0	3	1.5
2	PC	PC-CS391	Data Structures and Algorithms Lab	0	0	3	1.5
3	PC	PC-CS392	IT Workshop (Using Python) Lab	0	0	3	1.5
4	MC	MC371	Environmental Sciences	2	0	0	0
<i>Total Practical/ Sessional / Mandatory Course</i>				2	0	9	4.5
Total of Third Semester				17	0	9	19.5

Fourth Semester (Second Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	BS	BS-M404	Numerical Methods	2	0	0	2
2	PC	PC-CS(D)401	Computer Organization and Architecture	3	0	0	3
3	PC	PC-CS402	Operating System	3	0	0	3
4	PC	PC-CS403	Design and Analysis of Algorithm	3	0	0	3
5	PC	PC-CS404	Discrete Mathematics	3	0	0	3
<i>Total Theory</i>				14	0	0	14
Practical/ Sessional/ Mandatory Course							
1	BS	BS-M494	Numerical Methods Lab	0	0	2	1
2	PC	PC-CS(D)491	Computer Organization and Architecture Lab	0	0	3	1.5
3	PC	PC-CS492	Operating System Lab	0	0	3	1.5
4	PC	PC-CS493	Design and Analysis of Algorithm Lab	0	0	3	1.5
5	MC	MC472	Constitution of India	2	0	0	0
<i>Total Practical/ Sessional/ Mandatory Course</i>				2	0	11	5.5
Total of Fourth Semester				16	0	11	19.5

Fifth Semester (Third Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	PC	PC-CS(D)501	Machine Learning	3	0	0	3
2	PC	PC-CS502	Object Oriented Programming	3	0	0	3
3	PC	PC-CS503	Formal Language and Automata Theory	3	0	0	3
4	PC	PC-CS(D)504	Introduction to Data Science	2	0	0	2
5	PE	PE-CS501	Professional Elective-I	3	0	0	3
6	HM	HM-HU501	Economics for Engineers	3	0	0	3
<i>Total Theory</i>				17	0	0	17
Practical/ Sessional/ Mandatory Courses							
1	PC	PC-CS(D)591	Machine Learning Lab	0	0	3	1.5
2	PC	PC-CS592	Object Oriented Programming Lab	0	0	3	1.5
3	PC	PC-CS593	Introduction to R Programming Lab	0	0	2	1
4	HM	HM-HU591	Soft Skill Development Lab	0	0	2	1
5	MC	MC571	Aptitude Skill Development-I	2	0	0	0
<i>Total Practical/ Sessional/ Mandatory Courses</i>				2	0	10	5
Total of Fifth Semester				19	0	10	22

PE-CS501	Professional Elective-I
PE-CS(D)501A	Software Engineering
PE-CS501B	Advanced Algorithm
PE-CS501C	Computer Graphics

Sixth Semester (Third Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	PC	PC-CS601	Compiler Design	3	0	0	3
2	PC	PC-CS602	Database Management System	3	0	0	3
3	PC	PC-CS603	Computer Networks	3	0	0	3
4	PC	PC-CS(D)604	High Performance Computing	3	0	0	3
5	PE	PE-CS601	Professional Elective-II	3	0	0	3
6	PE	PE-CS602	Professional Elective-III	3	0	0	3
<i>Total Theory</i>				18	0	0	18
Practical/ Sessional/ Mandatory Courses							
1	PC	PC-CS692	Database Management System Lab	0	0	3	1.5
2	PC	PC-CS693	Computer Networks Lab	0	0	3	1.5
3	PC	PC-CS694	Software Development and IT Operations Lab	0	0	2	1
4	PW	PW-CS681	Project-I	0	0	6	3
5	MC	MC671	Aptitude Skill Development-II	2	0	0	0
<i>Total Practical/ Sessional/ Mandatory Courses</i>				2	0	14	7
Total of Sixth Semester				20	0	14	25

List of Elective Courses	
PE-CS601	Professional Elective-II
PE-CS601A	Data Mining
PE-CS601B	Pattern Recognition
PE-CS601C	Image Processing
PE-CS602	Professional Elective-III
PE-CS602A	Distributed Computing
PE-CS602B	Soft Computing
PE-CS602C	Data Analysis and Visualization

Seventh Semester (Fourth Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	PE	PE-CS701	Professional Elective-IV	3	0	0	3
2	PE	PE-CS702	Professional Elective-V	3	0	0	3
3	OE	OE-701	Open Elective-I	3	0	0	3
4	OE	OE-701	Open Elective-II	3	0	0	3
<i>Total Theory</i>				12	0	0	12
Practical/ Sessional							
1	PW	PW-CS781	Project-II	0	0	8	4
2	PW	PW-CS782	Summer Internship	0	0	4	2
<i>Total Practical/ Sessional</i>				0	0	12	6
Total of Seventh Semester				12	0	12	18

List of Elective Courses	
PE-CS701	Professional Elective-IV
PE-CS(D)701A	Data Security and Authentication
PE-CS701B	Cloud Computing
PE-CS701C	Neural Networks and Deep Learning
PE-CS702	Professional Elective-V
PE-CS702A	Natural Language Processing
PE-CS702B	Block Chain Technology
PE-CS(D)702C	Uncertainty Modelling and Multi-value Logic
OE-701	Open Elective-I
OE-EC701A	Adhoc and Sensor Network
OE-EC701B	Microprocessor and Microcontroller
OE-IT701D	Multimedia Systems
OE-M701A	Operations Research and Optimizing Technique
OE-701	Open Elective-II
OE-HU701B	Human Resource Development and Organizational Behavior
OE-HU701D	Time Series Analysis and Forecasting
OE-IT701A	Introduction to Bioinformatics
OE-IT701B	Cyber Law and Security Policy

Eighth Semester (Fourth Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	HM	HM-HU802	Professional Ethics and Project Management	2	0	0	2
2	PE	PE-CS801	Professional Elective-VI	3	0	0	3
3	OE	OE-801	Open Elective-III	3	0	0	3
4	OE	OE-801	Open Elective-IV	3	0	0	3
<i>Total Theory</i>				11	0	0	11
Practical/ Sessional							
1	PW	PW-CS881	Project-III	0	0	12	6
<i>Total Practical/ Sessional</i>				0	0	12	6
Total of Eighth Semester				11	0	12	17

List of Elective Courses	
PE-CS801	Professional Elective-VI
PE-CS801A	Big Data Analytics
PE-CS801B	Cryptography and Network Security
PE-CS801C	Web and Internet Technology
OE-801	Open Elective-III
OE-HU801B	Business Intelligence
OE-HU801G	Introduction to Philosophical Thoughts
OE-IT801B	E-Commerce
OE-IT801C	Internet of Things
OE-801	Open Elective-IV
OE-EC801A	Information and Coding Theory
OE-HU801A	Business Analytics and Entrepreneurship
OE-HU801E	Financial Management
OE-IT801D	Social Media and Web Analytics