USHA MITTAL INSTITUTE OF TECHNOLOGY

(umit.ac.in)

SNDT Women's University

(Sndt.digitaluniversity.ac)

Syllabus B. Tech.Data Science

SNDT Women's University
1, Nathibai Thackersey Road,
Mumbai 400 020
(Applicable to students taking admission in and after 2019)

Credit Definition

1 Hr. Lecture (L) per week	1 credit
1 Hr. Tutorial (T) per week	1 credit
1 Hr. Practical (P) per week	0.5 credits

2 Hours Practical(Lab)/week	1 credit

Course code and Definition:

Course Code	Definitions
L	Lecture
T	Tutorial
P	Practical
D	Duration of Paper
TP	Term Paper
TW	Term Work
P/V	Practical/Viva
BSC	Basic Science Courses
ESC	Engineering Science Courses
HSMC	Humanities and Social Sciences including Management courses
PCC	Professional core courses
PEC	Professional Elective courses
OEC	Open Elective courses
LC	Laboratory course
MC	Mandatory courses
PROJ	Project

	USHA MITTAL INSTITUTE OF TECHNOLOGY **SNDT Women's University** **Faculty : Technology (Undergraduate Course) -BTech**	**Proposed in Jan 2020**

Semester I

Category and Course Code	Course Title	Hours Per Week			Cr	D	TP	TW	P/V	Total
		L	T	P						
Basic Science course (BSC101)	Applied Science (Physics and Chemistry)	3	1	-	4.0	2.5	75	25		100
Basic Science course (BSC103)	Mathematics –I	3	1	-	4.0	2.5	75	25		100
Engineering Science Courses(ESC101)	Basic Electrical Engineering	3	1	-	4.0	2.5	75	25		100
Engineering Science Courses(ESC102)	Engineering Graphics & Design	1	-	-	1.0	1.0	25	-		25
	Applied Science Lab			3	1.5	-	25	25	PV	50
	Basic Electrical Engineering Lab			2	1.0	-	25	-	PV	25
	Engineering Graphics & Design Lab	-	-	4	2.0	-	25	25	V	50
Mandatory Course	Induction programme	3 weeks - no credits								
	Total	10	3	9	17.5					450

Semester II

Category and Course Code	Course Title	Hours Per Week			Cr	D	TP	TW	P/V	Total
		L	T	P						
Basic Science courses (BSC 102)	Applied Science (Physics and Chemistry)	3	1	-	4.0	2.5	75	25		100
Basic Science course (BSC104)	Mathematics –II	3	1	-	4.0	2.5	75	25		100
Engineering Science Courses(ESC103)	Programming for Problem Solving	3	-	-	3.0	2.5	75	25		100
Engineering Science Courses(ESC104)	Workshop/Manufacturing Practices	1	-	-	1.0	1.0	25	-		25
Humanities and Social Sciences including Management courses (HSMC101)	English	2	-	-	2.0	1.0	40	10		50
	Applied Science Lab			3	1.5	-	25	25	PV	50
	Programming for Problem Solving Lab			4	2.0	-	25	25	PV	50
	Workshop/Manufacturing Practices Lab			4	2.0		25	25	PV	50
	English Practical			2	1.0	-	-	25	-	25
Mandatory Course	Environmental Sciences	2	-	-	0	2.0	50	-	-	50
	Total	14	2	13	20.5					600

*Environmental Sciences is a mandatory credit less course in which the students will be required to get passing marks in the main exam

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SCHEME: Semester III

Category and Code	Course title	Hours per Week			Cr	D	TP	T W	P/ V	Total
		L	T	P						
Engineering Science Course ESC 301	Analog and Digital Electronics	3	0	-	3	2.5	75	25		100
Professional Core Courses PCC-CS 301	Data structure & Algorithms	3	0	-	3	2.5	75	25		100
Professional Core Courses ESC 302	Introduction to Data Science	3	0	-	3	2.5	75	25		100
Basic Science course BSC 301	Mathematics-III (Probability and Statistics)	2	0	0	2	1.5	50	0		50
Humanities for social science	Economics for Engineers	2	0	0	2	1.5	50	0		50
	Data Structure and Algorithms Lab			4	2	-	25	25	PV	50
	Analog and Digital Electronics Lab			4	2	-	25	25	PV	50
	Data Science Lab using Python			4	2	-	25	25	PV	50
	Total	13	0	12	19					550

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SCHEME: Semester IV

Category and Code	Course title	Hours per Week			Cr	D	TP	TW	P/V	Total
		L	T	P						
Professional Core Courses PCC-CS401	Discrete Mathematics	3	1	0	4	25	75	25		100
Professional Core Courses PCC- CS404	Design and Analysis of Algorithm	3	0	-	3	25	75	25		100
Professional Core Courses PCC-CS403	Database Management	3	0	-	3	25	75	25		100
Professional Course	Data Mining	3	0	-	3	25	75	25		100
Basic science course	Biology for engineers	3	0	0	3	2.5	75	25		100
Mandatory Course	Constitution of India	-	-	-	0	-	25	25		50
	Database Management Lab			4	2	-	25	25	PV	50
	Design and Analysis of Algorithm lab			4	2	-	25	25	PV	50
	Data mining lab			4	2		25	25	PV	50
	Total	15	1	12	22					700

NOTE: Subject "Constitution of India" is non credit subject, Passing is mandatory, A total of 16 hours needs to be completed.

Humanities Elective: $MOOC/ Swayam based course Certificate has to be provided by individual students to get evaluated.

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2 Hours Practical(Lab)/week	1 credit

Range of credits –

- Credits of 160-163 for a student to be eligible to get an Undergraduate degree in DATA SCIENCE.

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Non-credit subject Passing Mandatory. A total of 16 hours needs to be completed.

Humanities Elective: MOOC based courses have to be completed. Certificate has to be provided by individual students to get evaluated.

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SCHEME: Semester V

Category and Code	**Course title**	**Hours per Week**			**Cr**	**D**	**TP**	**TW**	**P/V**	**Total**
		L	**T**	**P**						
Professional Core Courses PCC- CS501	Object Oriented Programming	3	0	-	3	2.5	75	25		100
Professional Core Courses PCC- CS502	Data Network	3	0	0	3	2.5	75	25		100
Professional Core Courses PCC- CS503	Architecture for Data Processing	3	0	-	3	2.5	75	25		100
Professional Elective courses	**Elective-I (Machine Learning and Computing)**	3	0	0	3	2.5	75	25		100
Humanities &Social Sciences including Management courses	**Humanities I(Effective Technical Communication)**	3	0	0	3	2.5	75	25		100
Professional Core Courses PCC- CS504	Analysing, Visualizing and Applying data science	3	0	0	3	2.5	75	25		100
	Object Oriented Programming Lab			2	1	-		25	PV	25
	Data Network Lab			2	1	-		25	PV	25
	Architecture for Data Processing Lab			2	1	-		25	PV	25
	Elective-I (Machine Learning with python) Lab			2	1	-		25	PV	25

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	Analysing, Visualizing and Applying data science Lab			2	1			25	PV	25
	Total	18	0	8	23					725

Semester VI

Category and Code	Course title	Hours per Week			Cr	D	TP	TW	P/V	Total
		L	T	P						
Engineering Science Course ESC601	Microprocessor and Microcontroller	3	0	0	3	2.5	75	25		100
Professional Core Courses PCC	Data visualization	3	0	-	3	2.5	75	25		100
Professional Core Courses PCC	Software Engineering	3	0	-	3	2.5	75	25		100
Professional Elective courses PEC	Elective-II (Artificial Intelligence)	3	0	0	3	2.5	75	25		100
Professional Elective courses PEC	Elective-III (Neural Networks and Deep Learning)	3	0	0	3	2.5	75	25		100
Mandatory Course MC	**Essence of Indian Knowledge Tradition**	0	-	-	0		25	25		50
Project	Project-1	0	0	4	2	-	-	25	25	50
	Data visualization			2	1	-		25	PV	25
	Microprocessor and Microcontroller Lab			2	1	-		25	PV	25

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	Elective-II (Artificial Intelligence) Lab			2	1	-		25	PV	25
	Elective-III (Neural Networks and Deep Learning) Lab			2	1	-		25	PV	25
	Total	15		12	21					700

Course code					
Category	**Core Course (CE)**				
Course title	**Elective-I (Machine Learning and Computing)**				
Scheme and Credits	L	T	P	Credit	**Semester V**
	3	0	2	4	
Pre-requisites (if any)					
Course Objective	**The students will be able to** ● **Identify merits of machine learning algorithms and suggest suitable algorithm for the application.** ● **Learn about the most effective machine learning techniques, and gain practice implementing them and getting them to work for yourself** ● **To review and strengthen important mathematical concepts required for ML.** ● **Introduce the concept of learning patterns from data and develop a strong theoretical foundation for understanding state of the art Machine Learning algorithms**				
Course Outcomes	**At the end of this course students will demonstrate the ability to** ● Design and implement machine learning solutions to classification, regression and clustering problems. ● Evaluate and interpret the results of the different ML techniques.				