USHA MITTAL INSTITUTE OF TECHNOLOGY

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SNDT Women's University

(Sndt.digitaluniversity.ac)

Syllabus B. Tech. Computer Engineering

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

Range of credits –

- Credits of 160-163 for a student to be eligible to get an Undergraduate degree in Computer Engineering (CE).
- A student will be eligible to get an Undergraduate degree with **Minor Engineering, if she completes an additional 18-20 credits. These could be acquired through MOOCs offered at Institutes or approved by the department designed internally or with other agencies in the Institute.**

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.

Minor Degree Course

Students can choose from

Minor Degree in Blockchain

Minor Degree in Cyber Security

Minor Degree in Internet of Things (IoT)

Minor Degree in Robotics

Minor Degree in Virtual and Augmented Reality

Minor Degree in Data Science

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

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 Electronic Circuits	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	Digital Electronics	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
	Analog Electronic Circuits Lab			4	2	-	25	25	PV	50
	Data structure & Algorithms Lab			4	2	-	25	25	PV	50
	Digital Electronics Lab			4	2	-	25	25	PV	50
	IT Workshop (Sci Lab/MATLAB) Lab			4	2	-	25	25	PV	50
	Total	11	0	16	19					550

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	2.5	75	25		100
Engineering Science Course PCC-CS 402	Computer Organization & Architecture	3	0	-	3	2.5	75	25		100
Professional Core Courses PCC- CS403	Operating Systems	3	0	-	3	2.5	75	25		100
Professional Core Courses PCC- CS404	Design & Analysis of Algorithms	3	0	-	3	2.5	75	25		100
Humanities & Social Sciences including Management courses HSMC 401	Management 1 (Finance & Accounting)	3	0	0	3	2.5	75	25		100
Mandatory Courses MC	Constitution of India	-	-	-	0	-	25	25		50
	Computer Organization & Architecture Lab			4	2	-	25	25	PV	50
	Operating Systems Lab			4	2	-	25	25	PV	50
	Design & Analysis of Algorithms 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.

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	Database Management Systems	3	0	-	3	2.5	75	25		100
Professional Core Courses PCC- CS502	Formal Language & Automata Theory	3	0	0	3	2.5	75	25		100
Professional Core Courses PCC- CS503	Object Oriented Programming	3	0	-	3	2.5	75	25		100
Professional Elective courses	Elective-I (Machine Learning & 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
Open Elective courses OEC	Open Elective-I (Software Engineering)	3	0	0	3	2.5	75	25		100
	Database Management Systems Lab			2	1	-			25	25
	Object Oriented Programming Lab			2	1	-			25	25
	Elective-I (Machine Learning &Computing) Lab			2	1	-			25	25
	Open Elective-I Lab			2	1	-			25	25
	Total	18	0	8	22					700

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.

Minor Degree Course: Students can choose from

Minor Degree in Blockchain

Minor Degree in Cyber Security

Minor Degree in Internet of Things (IoT)

Minor Degree in Robotics

Minor Degree in Virtual and Augmented Reality

Minor Degree in Data Science

SCHEME: 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	Complier Design	3	0	-	3	2.5	75	25		100
Professional Core Courses PCC	Computer Networks	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 Courses MC	Essence and Importance of Indian Knowledge Tradition	0	-	-	0	-	-	25	25	50
Project	Project-1	0	0	4	2	-	-	25	25	50
	Complier Design Lab			2	1	-			25	25
	Computer Networks Lab			2	1	-			25	25
	Elective-II (Artificial Intelligence) Lab			2	1	-			25	25
	Elective-III (Neural Networks and Deep Learning) Lab			2	1	-			25	25
	Total	15		12	21					700

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.

Minor Degree Course

Students can choose from

Minor Degree in Blockchain

Minor Degree in Cyber Security

Minor Degree in Internet of Things (IoT)

Minor Degree in Robotics

Minor Degree in Virtual and Augmented Reality

Minor Degree in Data Science

SCHEME: Semester VII

Category and Code	Course title	Hours per Week			Cr	D	TP	TW	P/V	Total
		L	T	P						
Professional Elective courses PEC	Elective-IV (Cryptography and Network Security)	3	0	-	3	2.5	75	25		100
Professional Elective courses PEC	Elective-V (Cloud Computing)	3	0	-	3	2.5	75	25		100
Professional Elective courses PEC	Elective-VI (Computational Data analytics)	3	0	0	3	2.5	75	25		100
Professional Core Courses PCC	Natural Language Processing	3	0	0	3	2.5	75	25		100
Project	Project-II	0	0	8	4	-	-	50	50	100
	Elective-IV (Cryptography and Network Security) Lab			2	1	-			25	25
	Elective-V (Cloud Computing) Lab			2	1	-			25	25
	Elective-VI (Data analytics Lab)			2	1	-			25	25
	Natural Language Processing Lab			2	1				25	25
	Total	12	0	16	20					600

SCHEME: Semester VIII

Category and Code	**Course title**	**Hours per Week**			**Cr**	**D**	**TP**	**TW**	**P / V**	**Total**
		L	**T**	**P**						
	Internship	-	-	-	4	0	0	50	50	100
Open Elective courses OEC	Open Elective-II (Fundamentals of Bitcoins and cryptocurrencies)	-	-	-	0	0	0	25	25	50
Project	Project-III	-	-	32	16	-	-	200	200	400
				-	-	-		-		
	Total	0	0	32	20					550

- Under Internship, the Student should pursue an internship program of minimum 4 weeks with a company ,expected contact hours in industry 160 to 180hrs.
- The students undergoing such a program include compulsory industrial training of 4 credits, by the end of the eighth semester.
- Internships can be in offline or online mode.
- Every student is required to prepare a file containing documentary proofs of the activities done by her in an industry.
- Weekly progress report should be mailed to faculty mentor and industry supervisor.
- The student will have to submit the internship joining letter, daily attendance record , a detailed report and presentation and completion certificate from industry
- Students should maintain handwritten internship dairy(include daily attendance and daily progress report) signed by industry supervisor.
- Students undergo industrial training at the concerned Industry / Organization. In-between Faculty Member(s) evaluate(s) the performance of students once/twice and Evaluation Report of the students is submitted in the department with the consent of Industry persons/Trainers.

- Internship can be extended for **PROJECT III** with permission from the institute.
- Internship evaluation and Project III evaluation are separate .
- Non-credit subject Passing Mandatory. A total of 16 contact hours needs to be completed.
- Non Credit course, Report of outcome based case studies will be evaluated as continuous assessment

Elective I	**Elective II**	**Elective III**	**Elective IV**	**Elective V**	**Elective VI**
Machine Learning & Computing	Artificial Intelligence	Neural network and Deep learning	Cryptographic and network Security	Cloud Computing	Computational Data Analytics
Image and Video Processing	Web Data Mining	Human computer interaction	Object oriented modelling and design	Parallel and distributed algorithm	Advanced Computer Architecture
Information Theory and Coding	Multi-agent Intelligent	Optimization Techniques	Quantum Computing	High Performance Computing	Intellectual Property rights

Open Elective-I	**Open Elective-II**
Software Engineering	Fundamentals of Bitcoins and cryptocurrencies
Introduction to Philosophical Thoughts	Cyber Law and Ethics