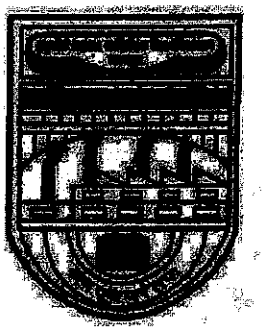
Course Curriculum

For

B. Tech. Information Technology



Academic Session: 2026-27

Department of Computer Science & Engineering

Harcourt Butler Technical University
Kanpur (208002)
As per NEP 2020

Department of Computer Science & Engineering

Course Structure (Semester wise)

B. Tech. Information Technology

(Applicable w.e.f. the Session 2026-2027)

Components of the Curriculum

(Program curriculum grouping based on course components)

Sr. No.	Curriculum Content			
	Course Component	**% of total number of credits of the Program**	**Total number of contact hours**	**Total number of Credits**
1	Basic Sciences (BSC)	11.62	21	20
2	Engineering Sciences (ESC)	10.46	05	18
3	Skill Enhancement (SEC)	2.32	08	04
4	Humanities and Social Sciences (HMSC)	5.23	11	9
5	Program Core (PCC)	59.88	135	103
6	Mandatory Course (MC)	0.00	00	00
7	Program Electives (PEC)	6.98	12	12
8	Open Electives (OEC)	3.49	06	06
	Total	**100.00**	**214**	**172**

I Semester

Sr. no.	Course Type	Category	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESE	Total Marks
						MSE	TA	Lab	Total		
1	BSC	Multidisciplinary	DMA 101	Mathematics-I	4(3-1-0)	30	20	-	50	50	100
2	BSC	Multidisciplinary	DPH101	Physics	4(3-0-2)	15	20	15	50	50	100
3	ESC	Multidisciplinary	DCS101	Programming for Problem Solving	4(3-1-0)	30	20	-	50	50	100
4	ESC	Multidisciplinary	DEE101	Basic Electrical Engineering	4(3-0-2)	15	20	15	50	50	100
5	SEC	Skill Enhancement	DCE101	Engineering Graphics & Design	2(0-0-4)	-	20	30	50	50	100
6	HSMC	Value Added Course Basket	DHS101	Universal Human Value	2(2-0-0)	30	20	-	50	50	100
7	HSMC	Ability Enhancement	DHS102	English for Technical Writing	2						100
8	MC	Mandatory Course	MC101	Induction Program	0(0-0-0)						
		Total Credits			**22**						**700**

II Semester

Sr. no.	Course Type	Category	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESE	Total Marks
						MSE	TA	Lab	Total		
1	BSC	Multidisciplinary	DCY201	Chemistry	4(3-0-2)	15	20	15	50	50	100
2	ESC	Multidisciplinary	DET201	Basic Electronics Engineering	3(2-1-0)	30	20	-	50	50	100
3	ESC	Multidisciplinary	DME101 /201	Basic Engineering Mechanics	4(3-1-0)	30	20	-	50	50	100
4	ESC	Value Added Course Basket	DCE201	Environmental Science and Engineering	3(2-1-0)	30	20	-	50	50	100
5	SEC	Skill Enhancement	DME202	Digital Fabrication/ Workshop/ Manufacturing Practices	2(0-0-4)	-	20	30	50	50	100
6	HSMC	Ability Enhancement	DHS203	Communication Skills	3(2-0-2)	15	20	15	50	50	100
7	PCC	Core	DCS201	Python Programming	3(2-0-2)	15	20	15	50	50	100
8	MC	Mandatory Course	MC202	NSS/Physical Activity/ Meditation &Yoga/ Photography/ Nature Club	0(0-0-0)						
		Total Credits			**22**						**700**

III Semester

Sr. no.	Course Type	Category	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESE	Total Marks
						MSE	TA	Lab	Total		
1	BSC	Multidisciplinary	DMA303	Computer Oriented Numerical Methods	4(3-0-2)	15	20	15	50	50	100
2	PCC	Core	DCS301	Computer Organization and Architecture	4(3-1-0)	30	20	-	50	50	100
3	PCC	Skill Enhancement	DCS302	Cyber Security	3(3-0-0)	30	20	-	50	50	100
4	PCC	Core	DCS303	Discrete Mathematics	3(3-0-0)	30	20	-	50	50	100
5	PCC	Core	DCS304	Software Engineering	4(3-0-2)	15	20	15	50	50	100
6	PCC	Ability Enhancement	DCS305	Data Structures	4(3-0-2)	15	20	15	50	50	100
7	MC	Mandatory Course	MC301	NSS/Physical Activity/ Meditation &Yoga/ Photography /Nature Club	0(0-0-0)						
		Total Credits			**22**						**600**

IV Semester

Sr. no.	Course Type	Category	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESE	Total Marks
						MSE	TA	Lab	Total		
1	BSC	Multidisciplinary	DMA 403	Mathematics-II	4(3-1-0)	30	20	-	50	50	100
2	PCC	Core	DCS401	Object Oriented Programming System	4(3-0-2)	15	20	15	50	50	100
3	PCC	Core	DCS402	Design and Analysis of Algorithms	4(3-0-2)	15	20	15	50	50	100
4	PCC	Core	DCS403	Operating System	4(3-1-0)	30	20	-	50	50	100
5	PCC	Skill Enhancement	DCS404	Data Science and Big Data Analytics	4(3-0-2)	15	20	15	50	50	100
6	HSMC	Value Added Course Basket			2						
7	MC	Mandatory Course	MC401	NSS/Physical Activity/Meditation& Yoga/ Photography / Nature Club	0(0-0-0)						
		Total Credits			**22**						**500**

V Semester

Sr. no.	Course Type	Category	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESE	Total Marks
						MSE	TA	Lab	Total		
1	PCC	Core	DCS501	Computer Networks	3(3-0-0)	30	20	-	50	50	100
2	PCC	Core	DCS502	Database Management Systems	4(3-0-2)	15	20	15	50	50	100
3	PCC	Core	DCS503	Theory of Computation	4(3-1-0)	30	20	-	50	50	100
4	PCC	Core	DCS504	Artificial Intelligence	3(3-0-0)	30	20	-	50	50	100
5	PCC	Core	DCS505	Machine Learning	4(3-0-2)	15	20	15	50	50	100
6	PCC	Skill Enhancement	DIT501	Web Technology	4(3-0-2)	15	20	15	50	50	100
7	MC	Mandatory Course	MC501	NSS/Physical Activity/Meditation & Yoga/ Photography/ Nature Club	0(0-0-0)						
		Total Credits			**22**						**600**

VI Semester

Sr. no.	Course Type	Category	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESE	Total Marks
						MSE	TA	Lab	Total		
1	PCC	Skill Enhancement	DCS601	Deep Learning	4(3-1-0)	30	20	-	50	50	100
2	PCC	Core	DCS602	Compiler Design	4(3-0-2)	15	20	15	50	50	100
3	PCC	Skill Enhancement	DCS603	Digital Image Processing	4(3-0-2)	15	20	15	50	50	100
4	PCC			Independent Study and Project	2(0-0-4)	-	-	50	50	50	100
5	PEC-I		DCS611-615	Program Elective-I	4(3-1-0)	30	20	-	50	50	100
6	PEC-II		DCS621-625	Program Elective-II	4(3-1-0)	30	20	-	50	50	100
7	MC	Mandatory Course	MC601	NSS/Physical Activity/Meditation &Yoga/ Photography/ Nature Club	0(0-0-0)						
		Total Credits			**22**						**600**

PEC-I

1. Soft Computing
2. Software Quality Assurance
3. Embedded System
4. Cloud Computing
5. Natural Language Processing

PEC-II

1. Cryptography & Network Security
2. Edge Computing
3. Nature Inspired Algorithms
4. Advanced Computer Architecture
5. Reinforcement Learning

VII Semester

Sr. no.	Course Type	Category	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESE	Total Marks
						MSE	TA	Lab	Total		
1	PCC	Skill Enhancement	DCS701	Mobile Application Development	3(3-0-0)	30	20	-	50	50	100
2	PCC		DCS702	Mobile Computing	3(3-0-0)	30	20	-	50	50	100
3	PEC-III		DCS731-736	Program Elective-III	3(3-0-0)	30	20	-	50	50	100
4	PEC-IV		DCS741-746	Program Elective-IV	3(3-0-0)	30	20	-	50	50	100
5	PCC	Mini/Minor PROJECT	DCS795	Project	6(0-0-12)	-	50	-	50	50	100
6	PCC	INTERNSHIP	DCS786	Summer Internship/ Industrial Training and Seminar	4(0-0-8)	-	50	-	50	50	100
		Total Credits			**22**						**600**

PEC-III

1. Computer Vision
2. Pattern Recognition
3. Quantum Computing
4. Software Project Management
5. Virtual and Augmented Reality
6. Advanced Python Programming

PEC-IV

1. Foundation of Generative AI and Large Language
2. Internet of Things
3. Business Intelligence
4. Blockchain Technology
5. Distributed Systems
6. Agentic AI

VIII Semester

Sr. no.	Course Type	Category	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESE	Total Marks
						MSE	TA	Lab	Total		
1	PCC	Major Project	DCS891	Project	12 (0-0-24)	-	50	-	50	50	100
2	PCC	OEC-I		NPTEL/MOOC/SWAYAM	3(3-0-0)	-	-	-	-	-	100
3	PCC	OEC-II		NPTEL/MOOC/SWAYAM	3(3-0-0)	-	-	-	-	-	100
		Total Credits			**18**						**300**

OEC-I

1. Cyber Security (DCS 811)

OEC-II

1. Machine Learning (DCS 821)