

**DEPARTMENT OF  
COMPUTER SCIENCE AND ENGINEERING**

**B. Tech. and M. Tech. (Dual Degree) in  
COMPUTER SCIENCE AND ENGINEERING**

<b>FIRST SEMESTER</b>						
<b>S. No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Category Code</b>	<b>I</b>	<b>P</b>	<b>C</b>
1.	DS101	Differential and Integral Calculus	BSC	3	0	3
2.	DS102	Engineering Physics	BSC	3	0	3
3.	ME101	Engineering Mechanics	BEC	3	0	3
4.	EC101	Basic Electrical and Electronics Engineering	BEC	3	0	3
5.	CS101	Problem Solving and Computer Programming	BEC	3	0	3
6.	DS103	Technical and Professional Communication	HMC	2	2	3
7.	DS104	Engineering Physics Practice	BSC	0	3	2
8.	CS102	Problem Solving and Computer Programming Practice	BEC	0	3	2
9.	ME102	Engineering Skills Practice	BEC	0	3	2
10.	ID101	NSS/NSO/NCC	HMC	0	0	0
<b>Total No. of Credits</b>						<b>24</b>

<b>SECOND SEMESTER</b>						
<b>S. No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Category Code</b>	<b>I</b>	<b>P</b>	<b>C</b>
1.	DS151	Probability and Statistics	BSC	3	0	3
2.	DS152	Linear Algebra	BSC	3	0	3
3.	DS153	Modern Physics	BSC	3	0	3
4.	DSxxx	Design Elective	DES	2	0	2
5.	DSxxx	Humanities Elective	HMC	2	0	0
6.	ME151	Concepts in Engineering Design	DES	3	0	3
7.	ME152	Design Realization Practice	DES	0	3	2
8.	DS154	Modern Physics Practice	BSC	0	3	2
9.	CS151	Digital Logic Design	BEC	2	3	4
10.	CS152	Python Programming Practice	BEC	0	3	2
11.	ID101	NSS/NCC/NSO	HMC	0	0	0
<b>Total No. of Credits</b>						<b>24</b>

THIRD SEMESTER						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	DS201	Random Variables and Stochastic Processes	BSC	3	0	3
2.	CS201	Discrete Mathematics	PEC	3	0	3
3.	CS202	Data Structures	PEC	3	0	3
4.	CS203	Computer Organization and Architecture	PEC	3	0	3
5.	CS204	Design and Analysis of Algorithms	PEC	3	0	3
6.	CS205	Data Structures Practice	PEC	0	3	2
7.	CS206	Computer Organization and Architecture Practice	PEC	0	3	2
8.	CS207	Design and Analysis of Algorithms Practice	PEC	0	3	2
9.	IDxxx	Self-Improvement Course I	HMC	0	0	0
<b>Total No. of Credits</b>						<b>21</b>

FOURTH SEMESTER						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	CS251	Automata Theory and Compiler Design	PEC	3	0	3
2.	CS252	Artificial Intelligence	PEC	3	0	3
3.	CS253	Operating Systems	PEC	3	0	3
4.	CS254	Data Communication and Computer Networking	PEC	3	0	3
5.	CS255	Embedded Systems and IoT	PEC	2	2	3
6.	CS256	Automata and Compiler Design Practice	PEC	0	3	2
7.	CS257	Operating Systems Practice	PEC	0	3	2
8.	CS258	Computer Networks Practice	PEC	0	3	2
9.	XXxxx	Skill Development Course I	PCD	2	0	2
10.	IDxxx	Self-Improvement Course II	HMC	0	0	0
<b>Total No. of Credits</b>						<b>23</b>

FIFTH SEMESTER						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	DS301	Managerial Economics and Financial Accountancy	HMC	3	0	3
2.	CS301	Machine Learning	PEC	3	0	3
3.	CS302	Database Management Systems	PEC	3	0	3
4.	CS303	Software Engineering	PEC	3	0	3
5.	CS304	Data Mining	PEC	3	0	3
6.	CS305	Machine Learning Practice	PEC	0	3	2
7.	CS306	Database Management Systems Practice	PEC	0	3	2
8.	CS307	Software Engineering Practice	PEC	0	3	2
9.	IDxxx	Self-Improvement Course III	HMC	0	0	0
<b>Total No. of Credits</b>						<b>21</b>

SIXTH SEMESTER						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	DS351	Entrepreneurship and Management Functions	PEC	3	0	3
2.	CS351	High Performance and GPU Computing	PEC	3	0	3
3.	CS352	Computer Vision	PES	3	0	3
4.	XXxxx	Elective I	PEC	3	0	3
5.	XXxxx	Elective II	PEC	3	0	3
6.	CS353	High Performance and GPU Computing Practice	PEC	0	3	2
7.	CS354	Computer Vision Practice	PEC	0	3	2
8.	ID351	Product Design Practice	DES	0	3	2
9.	XXxxx	Skill Development Course II	PCD	2	0	2
9.	IDxxx	Self-Improvement Course IV	HMC	0	0	0
<b>Total No. of Credits</b>						<b>23</b>

SEVENTH SEMESTER						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	CS501	Mathematical Foundations of Computer Science	PEC	3	0	3
2.	CS502	Advanced Data Structures and Algorithms	PEC	3	3	5
3.	CS503	Artificial Intelligence	PEC	3	3	5
4.	CS504	Computer Systems	PEC	3	3	5
5.	XXxxx	Elective III	PEC	3	0	3
6.	CS594	Seminar	PCD	0	3	2
<b>Total No. of Credits</b>						<b>23</b>

EIGHT SEMESTER						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	CS511	Embedded Systems and IoT	PEC	3	3	5
2.	CS512	Distributed Systems	PEC	3	3	5
3.	CS513	HPC and GPU Computing	PEC	3	3	5
4.	XXxxx	Elective IV	PEC	3	0	3
5.	XXxxx	Elective V	PEC	3	0	3
6.	CS595	Technical Writing	PCD	0	3	2
<b>Total No. of Credits</b>						<b>23</b>

NINTH SEMESTER						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	CS598	Dissertation Phase I	PCD	-	-	13
<b>Total No. of Credits</b>						<b>13</b>

TENTH SEMESTER						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	CS599	Dissertation Phase II	PCD	-	-	15
<b>Total No. of Credits</b>						<b>15</b>

## Elective Courses

List of Design Electives						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	DS131	Design History	DES	2	0	2
2.	DS132	Sociology of Design	DES	2	0	2
3.	DS133	Earth, Environment and Design	DES	2	0	2

List of Humanities Electives						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	DS136	Professional Ethics for Engineers	HMC	2	0	0
2.	DS137	Universal Human Values	HMC	2	0	0
3.	DS138	Constitution of India	HMC	2	0	0
4.	DS139	History of Science and Technology in India	HMC	2	0	0

List of Electives						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	CS470	Principles of Programming	PEC	3	0	3
2.	CS471	Artificial Intelligence and Machine Learning	PEC	3	0	3
3.	CS472	Introduction to Data Science	PEC	3	0	3
4.	CS473	Systems Engineering	PEC	3	0	3
5.	DS470	Differential Equations	PEC	3	0	3
6.	DS471	Materials and Devices for Quantum Technologies	PEC	3	0	3
7.	DS472	Numerical Methods	PEC	3	0	3
8.	DS473	Quantum Computing	PEC	3	0	3
9.	DS474	Sustainable Design	PEC	3	0	3
10.	CS521	Game Theory	PEC	3	0	3
11.	CS522	Natural Language Processing	PEC	3	0	3
12.	CS523	Information Retrieval	PEC	3	0	3
13.	CS524	Recommender Systems	PEC	3	0	3
14.	CS525	Systems Engineering	PEC	3	0	3
15.	CS526	Health Analytics	PEC	3	0	3
16.	CS527	Social Network Analysis	PEC	3	0	3
17.	CS528	Unmanned Aerial Vehicle	PEC	3	0	3
18.	CS529	Robotics	PEC	3	0	3
19.	CS530	Time Series Analysis	PEC	3	0	3
20.	CS531	Human Computer Interaction	PEC	3	0	3
21.	CS532	Modern Computational Algebra	PEC	3	0	3
22.	CS533	Affective Computing	PEC	3	0	3
23.	CS534	Simulation and Modelling	PEC	3	0	3

24.	CS535	Decision Science	PEC	3	0	3
25.	CS536	Quantum Computing	PEC	3	0	3
26.	CS537	Data Science	PEC	3	0	3
27.	CS538	Parallel and Distributed Systems	PEC	3	0	3
28.	CS539	Real-time Systems	PEC	3	0	3
29.	CS540	Big Data Analytics	PEC	3	0	3
30.	CS541	Data Privacy	PEC	3	0	3
31.	CS542	Marketing Science and Predictive Analysis	PEC	3	0	3
32.	CS543	Cyber Forensics	PEC	3	0	3
33.	CS544	Statistical Learning	PEC	3	0	3
34.	CS545	Decision Support Systems	PEC	3	0	3
35.	CS546	Immersive Technologies	PEC	3	0	3
36.	CS547	Bioinformatics	PEC	3	0	3
37.	CS548	Advanced Data Mining	PEC	3	0	3
38.	CS549	Computational Learning Theory	PEC	3	0	3
39.	CS550	Wireless Networked Systems	PEC	3	0	3
40.	CS551	Post Quantum Cryptography	PEC	3	0	3
41.	CS552	Research Methodology	PEC	3	0	3
42.	CS553	Scalable Data Science	PEC	3	0	3
43.	CS402	Internet of Things	PEC	3	0	3
44.	CS406	Blockchain	PEC	3	0	3
45.	CS407	Object Oriented Programming	PEC	3	0	3
46.	CS409	Industry 4.0	PEC	3	0	3
47.	CS412	Information Theory and Coding	PEC	3	0	3
48.	CS416	Information Security	PEC	3	0	3
49.	CS418	Design Patterns	PEC	3	0	3
50.	CS421	Genetic Algorithm	PEC	3	0	3
51.	CS425	Software Testing	PEC	3	0	3
52.	CS426	Soft Computing	PEC	3	0	3
53.	CS428	Advanced Data Structures and Algorithms	PEC	3	0	3
54.	CS429	Graph Theory	PEC	3	0	3
55.	CS430	Approximation and Randomized Algorithms	PEC	3	0	3
56.	CS431	Digital Image Processing	PEC	3	0	3
57.	CS432	Mobile Computing	PEC	3	0	3
58.	CS433	Pattern Recognition	PEC	3	0	3
59.	CS434	Cloud Computing	PEC	3	0	3
60.	CS436	Business Intelligence	PEC	3	0	3
61.	CS437	Service Oriented Architecture	PEC	3	0	3
62.	CS440	Fault-Tolerant Systems	PEC	3	0	3
63.	CS441	Computer Graphics and Multimedia	PEC	3	0	3
64.	CS442	Scalable Data Science	PEC	3	0	3
65.	CS443	Optimization Techniques	PEC	3	0	3
66.	CS444	Embedded Systems	PEC	3	0	3
67.	CS449	Financial Analytics	PEC	3	0	3

68.	CS450	Data Analysis and Visualization	PEC	3	0	3
69.	CS454	Bio-Inspired Computing	PEC	3	0	3
70.	CS458	Algorithmic Techniques for Big Data	PEC	3	0	3
71.	CS459	Mining of Massive Datasets	PEC	3	0	3
72.	CS460	Virtual Reality and Augmented Reality	PEC	3	0	3
73.	CS461	Cluster Computing	PEC	3	0	3
74.	CS464	Modern Computational Algebra	PEC	3	0	3
75.	CS465	Web Technologies	PEC	3	0	3
76.	CS466	Cryptography and Network Security	PEC	3	0	3
77.	CS467	Principles of Programming	PEC	3	0	3
78.	CS468	Remote Sensing and GIS	PEC	3	0	3
79.	CS469	Gen AI	PEC	3	0	3

## Self-Improvement Courses

List of Self Improvement Courses						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	ID401	Physical (Sports, Dance, Body Building, etc.)	HMC	0	0	0
2.	ID402	Health and Nutrition (Medical) Awareness (Basics awareness on Medicine, Diseases, Remedies, Nutrition, etc.)	HMC	0	0	0
3.	ID403	Personality Enhancement/Character Building (emotional development, Reading biography of great personalities, Responsibility and ownership towards nation)	HMC	0	0	0
4.	ID404	Language and music (Learning new languages, poetry, public speaking, vocabulary enhancement, singing, Musical instrument, etc.)	HMC	0	0	0
5.	ID405	Passion (Any passion of the student not registered earlier)	HMC	0	0	0
6.	ID406	Financial Awareness (Awareness on Insurances, Investments, financial planning, Money Management, etc.)	HMC	0	0	0

## Skill Development Courses

List of Skill Development Courses						
S. No.	Course Code	Course Name	Category Code	I	P	C
1.	CS381	Linux Administration	PCD	2	0	2
2.	CS382	Full Stack Development	PCD	2	0	2
3.	CS383	DevOps Toolchain	PCD	2	0	2
4.	CS384	Digital Marketing	PCD	2	0	2
5.	CS385	Graphic Design and Editing	PCD	2	0	2
6.	CS386	Product Automation	PCD	2	0	2
7.	CS387	Systems Programming	PCD	2	0	2
8.	CS388	Software Toolbox	PCD	2	0	2
9.	CS389	Mobile app Development	PCD	2	0	2
10.	CS390	Ethical Hacking	PCD	2	0	2
11.	CS391	Low Code Development	PCD	2	0	2
12.	ME381	Data Science for Engineers	PCD	2	0	2
13.	ME382	Basics of Finite Element Analysis	PCD	2	0	2
14.	ME383	Fuzzy Logic and Neural Network	PCD	2	0	2
15.	ME384	Design, Technology and Innovation	PCD	2	0	2
16.	ME385	Manufacturing Guidelines for Product Design	PCD	2	0	2
17.	ME386	Artificial Intelligence for Mechanical Engineers	PCD	2	0	2
18.	ME387	Database Management System	PCD	2	0	2
19.	ME388	Failure Analysis and prevention	PCD	2	0	2
20.	EC381	Industry 4.0	PCD	2	0	2