

**UNIVERSITY SCHOOL
OF
INFORMATION AND COMMUNICATION TECHNOLOGY**
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND 4IR TECHNOLOGIES

PROGRAMME STRUCTURE

**B.TECH. COMPUTER SCIENCE AND ENGINEERING
SPECILIZATION IN MACHINE LEARNING
2021-2025**



**GAUTAM BUDDHA UNIVERSITY
GAUTAM BUDH NAGAR, GREATER NOIDA, UP, INDIA**

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SEMESTER I

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CS101	Fundamentals of Computer Programming	3	1	0	4	CC1 / FC
2	CM101	Fundamental of Machine Learning	2	0	0	2	CC2 / FC
3	MA101	Engineering Mathematics-I	3	1	0	4	GE1
4	PH102	Engineering Physics	3	1	0	4	GE2
5	EC101	Basic Electronics Engineering	3	1	0	4	GE3 / FC
6	EN101	English Proficiency	2	0	0	2	OE1 / AECC
7	CE103	Engineering Graphics Lab	1	0	2	2	GE-L1
8	CS181	Computer Programming Lab	0	0	2	1	CC-L1 / SEC
9	PH104	Engineering Physics Lab	0	0	2	1	GE-L2
10	EC181	Basic Electronics Engineering Lab	0	0	2	1	GE-L3
11	GP	General Proficiency	Non Credit				
Total Hours and Credits			17	4	8	25	

SEMESTER II

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CM102	Introduction to Python	2	0	0	2	CC3 / FC
2	CM104	Computer Organistaion and Architecure	3	0	0	3	CC4 / SEC
3	MA102	Engineering Mathematics-II	3	1	0	4	GE4
4	EE102	Basic Electrical Engineering	3	1	0	4	GE5
5	ME101	Engineering Mechanics	3	1	0	4	GE6
6	ES101	Environmental Studies	3	1	0	4	OE2 / AECC
7	CM182	Python Programming Lab	0	0	2	1	CC-L2 / SEC
8	EE104	Basic Electrical Engineering Lab	0	0	2	1	GE-L4
9	ME102	Workshop Practice	1	0	2	2	GE-L5
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			16	4	6	25	

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B.Tech. (Computer Science and Engineering) Specialization : Machine Learning

Effective from 2021 (Batch 2021-2025)

SEMESTER III

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CM201	Internet Technology	3	0	0	3	CC5 / SEC
2	CM203	Operating Systems	3	0	0	3	CC6
3	CM205	Data Structure & Algorithms	3	0	0	3	CC7 / SEC
4	CM207	Computer Vision	3	0	0	3	CC8
5	CM209	Introduction to R Programming	3	0	0	3	CC9
6	MA201	Engineering Mathematics-III	3	1	0	4	GE7
7	CM281	R Programmiing Lab	0	0	3	2	CC-L3
8	CM283	Data Structure & Algorithms Lab	0	0	3	2	CC-L4 / SEC
9	CM285	Internet Technology Lab	0	0	3	2	CC-L5 / SEC
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			18	1	9	25	

SEMESTER IV

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CM202	Software Engineering	3	0	0	3	CC10
2	CM204	Database Management System	3	0	0	3	CC11 / SEC
3	CM206	Java Programming	3	0	0	3	CC12
4	CM208	Artificial Intelligence	3	0	0	3	CC13
5	CM210	Theory of Automata	3	0	0	3	CC14
6	CM212	Introduction to MATLAB	3	1	0	4	CC15 / SEC
7	CM282	Database Management System Lab	0	0	3	2	CC-L6 / SEC
8	CM284	Java Programming Lab	0	0	3	2	CC-L7 / SEC
9	CM286	MATLAB	0	0	3	2	CC-L8 / SEC
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			18	1	9	25	

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SEMESTER V

S.No.	Course Code	Course Name	L	T	P	Credits	Types
			3	0	0	3	CC16 / AECC
1	CM301	Compiler Design	3	0	0	3	CC17
2	CM303	Soft Computing Techniques	3	0	0	3	CC18
3	CM305	Analysis and Design of Algorithms	3	0	0	3	CC19
4	CM307	Big Data Analytics	3	1	0	4	CC20 / SEC
5	CM309	Machine Learning	3	0	0	3	E1 / DSE
6		Elective 1	0	0	3	2	CC-L9 / SEC
7	CM381	Analysis and Design of Algorithms Lab	0	0	3	2	CC-L10 / SEC
8	CM383	Big Data Analytics Lab	0	0	3	2	CC-L11 / SEC
9	CM385	Machine Learning Lab using Python	Non Credit				
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			18	1	9	25	

SEMESTER VI

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CM302	Web Development using PHP	3	0	0	3	CC21
2	CM304	Deep Learning	3	0	0	3	CC22
3	CM306	Reinforcement Learning	3	1	0	4	CC23
4	CM308	Human Machine Interaction	3	0	0	3	CC24
5	CM310	Knowledge Representation	3	0	0	3	CC25 / SEC
6		Elective 2	3	0	0	3	E2 / DSE
7	CM382	Web Development using PHP Lab	0	0	3	2	CC-L12
8	CM384	Deep Learning Lab using Python	0	0	3	2	CC-L13
9	CM386	Reinforcement Learning Lab using Python	0	0	3	2	CC-L14
10	GP	General Proficiency	Non Credit				
Total Hours and Credits			18	1	9	25	

Industrial Training will be done by candidate individually after third year during the summer break and it will be of minimum 4 weeks. It will be evaluated as per University Examination in VII semester.

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SEMESTER VII

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	MA401	Modeling & Simulation	3	1	0	4	GE8
2	CM401	Data Visualization	3	0	0	3	CC26
3	CM403	Applied Machine Learning	2	0	0	2	CC27 / SEC
4		Elective 3	3	0	0	3	E3 / DSE
5		Elective 4	3	0	0	3	E4 / DSE
6	CM481	Applied Machine Learning Lab	0	0	3	2	CC-L15
7	CM491	Minor Project	0	0	10	5	MP1 / E
8	CM493	Industrial Training	0	0	6	3	IT1 / E
9	GP	General Proficiency	Non Credit				
Total Hours and Credits			14	1	19	25	

SEMESTER VIII

S.No.	Course Code	Course Name	L	T	P	Credits	Types
1	CM490	Seminar	0	0	3	2	S / E
2	CM492	Major Project	0	0	16	8	MP2 / E
3	CM494	Internship	0	0	30	15	I / E
4	GP	General Proficiency	Non Credit				
Total Hours and Credits			0	0	49	25	

GRAND TOTAL OF CREDITS = 200

In the **Seminar**, student need to study and present individually, on latest research paper of their specialized area and It will be evaluated as per University Examination Rules.

The **Internship** in Industry will be done by candidate individually during the 8th semester and it will be for a minimum of 4 (-6) months. It will be evaluated as per University Examination Rules.

Minor and Major Project will be in a group and It will be evaluated as per University Examination Rules.

USICT will provide a mentor/supervisor for industrial training, seminar, internship, minor and major projects.

ELECTIVES FROM AI4IRT			L	T	P	Credits	Types
S.No.	Course Code	Course Name	3	0	0	3	E1
1	CM311	Computational Intelligence	3	0	0	3	E1
2	CM313	Stochastic Processes	3	0	0	3	E1
3	CM315	Machine Learning Algorithms	3	0	0	3	E1
4	CM317	Decision Thinking and Algorithm Design	3	0	0	3	E1
5	CM319	Statistical Machine Learning	3	0	0	3	E2
6	CM312	Artificial Neural Networks	3	0	0	3	E2
7	CM314	Knowledge Engineering	3	0	0	3	E2
8	CM316	Graph Theory	3	0	0	3	E2
9	CM318	Expert Systems	3	0	0	3	E2
10	CM320	Fuzzy logic	3	0	0	3	E3
11	CM405	Computational Neuroscience	3	0	0	3	E3
12	CM407	Intelligent Machining	3	0	0	3	E3
13	CM409	Introduction to Brain and Neuroscience	3	0	0	3	E3
14	CM411	Digital Fabrication	3	0	0	3	E3
15	CM413	Internet of Things	3	0	0	3	E3
16	CM415	Digital Image Processing	3	0	0	3	E4
17	CM417	Ensemble learning	3	0	0	3	E4
18	CM419	Predictive Analysis	3	0	0	3	E4
19	CM421	Embedded Systems	3	0	0	3	E4
20	CM423	Machine Intelligence for Medical Image Analysis	3	0	0	3	E4

CM Computer Science & Engineering / Machine Learning for Course Code

CC Core Course from USICT for course type

GE General Elective from related discipline of other Deptt./School

GE L General Elective Lab from related discipline of other Deptt./School

OE Open Elective from other discipline of other Deptt./School

AECC Ability Enhancement Compulsary Course

DSE Discipline Specific Course

SEC Skill Enhancement Course

E Elective from USICT

CC-L Core Course Lab from USICT

IT1 Industrial Training

MP Minor / Major Project

S Seminar

I Internship