



**BRAINWARE UNIVERSITY**  
**SCHOOL OF ENGINEERING**  
**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**B. Tech. Computer Science & Engineering- Artificial Intelligence and Machine Learning- 2023**  
**SEMESTER – I**

Course Code	Course Name	Course Type	Hours per week			Credits	Total Marks
			L	T	P		
HSMCM101	Communication Skills	HS	3	0	0	3	100
BSCM101	Semiconductor Physics	BS	3	0	0	3	100
BSCM102	Calculus & Linear Algebra	BS	4	0	0	4	100
ESCM101	Basic Electrical and Electronics Engineering	ES	3	0	0	3	100
BSCM191	Semiconductor Physics Lab	BS	0	0	3	1.5	100
ESCM191	Basic Electrical and Electronics Engineering Lab	ES	0	0	3	1.5	100
ESCM192	Engineering Graphics & Design Lab	ES	0	0	3	1.5	100
Total						17.5	700
AUM-1	Environmental Science	AU	1	0	0	0	0

**Total hours:23**

**SEMESTER – II**

Course Code	Course Name	Course Type	Hours per Week			Credits	Total Marks
			L	T	P		
HSMCM201	Effective Communication Skills	HS	3	0	0	3	100
BSCM201	Engineering Chemistry	BS	3	0	0	3	100
BSCM202	Probability & Statistics	BS	3	0	0	3	100
BSCM203	Biology for Engineers	BS	2	0	0	2	50
ESCM201	Programming for Problem solving	ES	3	0	0	3	100
HSMCM291	Effective Communication Skills Lab	HS	0	0	3	1.5	100
BSCM291	Engineering Chemistry Lab	BS	0	0	3	1.5	100
ESCM291	Programming for Problem solving Lab	ES	0	0	3	1.5	100
ESCM292	Workshop / Manufacturing Practices	ES	0	0	3	1.5	100
Total						20	850
AUM-2	Yoga and Sports	AU	1	0	0	0	0

**Total hours:27**



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**SEMESTER – III**

Course Code	Course Name	Course Type	Hours per week			Credits	Total Marks
			L	T	P		
BSCM301	Differential Equation and Complex Analysis	BS	4	0	0	4	100
ESCM301	Applied Digital Logic Design	ES	3	0	0	3	100
ESCM302	Data Structure & Algorithms	ES	3	0	0	3	100
ESCM303	Introduction to Python Programming	ES	3	0	0	3	100
PCC-CSM301	Computer Organization & Architecture	PC	3	0	0	3	100
ESCM391	Applied Digital Logic Design Lab	ES	0	0	3	1.5	100
ESCM392	Data Structure & Algorithms Lab	ES	0	0	3	1.5	100
ESCM393	Introduction to Python Programming Lab	ES	0	0	3	1.5	100
PCC-CSM391	Computer Organization & Architecture Lab	PC	0	0	3	1.5	100
Total						22	900
AUM-3	Constitution of India	AU	1	0	0	0	0

**Total hours:29**

**SEMESTER – IV**

Course Code	Course Name	Course Type	Hours per week			Credits	Total Marks
			L	T	P		
HSMCM401	Design Thinking for Entrepreneurship and Startups	HS	3	0	0	3	100
PCC-CSM401	Operating Systems	PC	3	0	0	3	100
PCC-CSM402	Design and Analysis of Algorithms	PC	3	0	0	3	100
PCC-CSM403	Object Oriented Programming	PC	3	0	0	3	100
PCC-CSM404	Formal Language & Automata Theory	PC	3	0	0	3	100
PCC-CSM405	Discrete Mathematics	PC	4	0	0	4	100
PCC-CSM491	Operating Systems Lab	PC	0	0	3	1.5	100
PCC-CSM492	Design and Analysis of Algorithms Lab	PC	0	0	3	1.5	100
PCC-CSM493	Object Oriented Programming Lab	PC	0	0	3	1.5	100
Total						23.5	900

**Total hours:28**



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**SEMESTER – V**

Course Code	Course Name	Course Type	Hours per week			Credits	Total Marks
			L	T	P		
PCC-CSM501	Database Management Systems	PC	3	0	0	3	100
PCC-CSM502	Computer Networks	PC	3	0	0	3	100
PCC-CSM503	Artificial Intelligence for Real World Application	PC	3	0	0	3	100
PCC-CSM504	Compiler Design	PC	3	0	0	3	100
PEC-CSM501	Elective-I A. Image Processing B. Bioinformatics C. Cloud Computing	PE	3	0	0	3	100
PCC-CSM591	Database Management Systems Lab	PC	0	0	3	1.5	100
PCC-CSM592	Computer Networks Lab	PC	0	0	3	1.5	100
PCC-CSM593	Artificial Intelligence for Real World Application Lab	PC	0	0	3	1.5	100
PEC-CSM591	Elective-I A. Image Processing Lab B. Bioinformatics Lab C. Cloud Computing Lab	PE	0	0	3	1.5	100
Total						21	900

**Total hours:27**



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**SEMESTER – VI**

Course Code	Course Name	Course Type	Hours per week			Credits	Total Marks
			L	T	P		
PCC-CSM601	Machine Learning and its Applications	PC	3	0	0	3	100
PCC-CSM602	Data Mining and Data Warehousing	PC	3	0	0	3	100
PEC-CSM601	Elective-II A. Soft Computing B. Optimization Techniques C. Pattern Recognition	PE	3	0	0	3	100
PEC-CSM602	Elective-III A. Computer Vision B. Human Computer Interaction C. Speech and Natural Language Processing	PE	3	0	0	3	100
OEC-CSM601	Open Elective-I A. Software Project Management B. Digital Communication C. Game Theory with Engineering Applications D. MOOC	OE	3	0	0	3	100
PCC-CSM691	Machine Learning and its Applications Lab	PC	0	0	3	1.5	100
PCC-CSM692	Data Mining and Data Warehousing Lab	PC	0	0	3	1.5	100
PEC-CSM691	Elective-II A. Soft Computing Lab B. Optimization Techniques Lab C. Pattern Recognition Lab	PE	0	0	3	1.5	100
PROJ-CSM681	Technical Seminar with Modern Tool Application	PROJ	-			2	100
Total						21.5	900

**Total hours:24**



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**SEMESTER – VII**

Course Code	Course Name	Course Type	Hours per Week			Credits	Total Marks
			L	T	P		
PCC-CSM701	Software Engineering	PC	3	0	0	3	100
PEC-CSM701	Elective-IV A. Deep Learning B. Intelligent Multi Agent and Expert Systems C. Cyber Threat Intelligence	PE	3	0	0	3	100
PEC-CSM702	Elective-V A. Quantum Computing B. Introduction to Data Analytics and Visualization C. Data and Internet Security	PE	3	0	0	3	100
OEC-CSM701	Open Elective-II A. AI with Robotics B. Digital Signal Processing C. Intelligent Embedded Systems D. MOOC	OE	3	0	0	3	100
OEC-CSM702	Open Elective-III A. Soft Skills and Interpersonal Communication B. Human Resource Development and Organizational Behavior C. Cyber Law and Ethics D. MOOC	OE	3	0	0	3	100
PCC-CSM791	Software Tools and Techniques Lab	PC	0	0	2	1	50
PROJ-CSM781	Industrial Training	PROJ	-			2	100
PROJ-CSM782	Project-I	PROJ	-			4	100
Total						22	750

**Total hours:17**



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**SEMESTER – VIII**

Course Code	Course Name	Course Type	Hours per week			Credits	Total Marks
			L	T	P		
OEC-CSM801	Open Elective-IV A. Electronic Design Automation B. VLSI Design C. MOOC	OEC	3	0	0	3	100
PROJ-CSM881	Grand Viva	PROJ	-			4	100
PROJ-CSM882	Project-II	PROJ	-			6	100
Total			<b>3</b>	<b>0</b>	<b>0</b>	13	300

**Total hours:3**

**Total Credit: 160.5**

**Total Marks:6200**