S. B. JAIN INSTITUTE OF TECHNOLOGY, MANAGEMENT & RESEARCH, NAGPUR

(An Autonomous Institute, Affiliated to RTMNU, Nagpur)

DEPARTMENT OF EMERGING TECHNOLOGIES (AI&ML and AI&DS)

CURRICULUM SCHEME
FOR
B. TECH. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
With Effect from Session 2022-2023

2nd YEAR

SEMESTER-III

Scheme of Teaching & Examination of Bachelor of Technology III Semester B.Tech. (Artificial Intelligence and Machine Learning)

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
1	BSCAM301T	Engineering Mathematics III	3	1	0	4	40	60	100	3
2	PCCAM301T	Operating System	4	0	0	4	40	60	100	3
3	PCCAM302T	Fundamentals of Digital Electronics & Computer Architecture	3	0	0	3	40	60	100	3
4	PCCAM303T	Data Structures & Algorithms	3	0	0	3	40	60	100	3
5	PCCAM303P	Data Structures & Algorithms Lab	0	0	2	1	25	25	50	--
6	PCCAM304T	Object Oriented Programming	3	0	0	3	40	60	100	3
7	PCCAM304P	Object Oriented Programming Lab	0	0	2	1	25	25	50	--
8	PCCAM305P	Python Programming Lab	0	0	4	2	25	25	50	--
9	HSMCAM301T	Ethics for IT Engineers and IPR	2	0	0	2	20	30	50	2
10	MCAM301	Essence of Indian Traditional Knowledge	2	0	0	0	50	--	50	--
11	PROJAM301	Practice School-I (Internship of 1-2 week)	-	-	-	1	During Summer Vacations after II Semester			
		TOTAL	20	1	08	24	345	405	750	--

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DEPARTMENT OF EMERGING TECHNOLOGIES (AI&ML and AI&DS)

2nd YEAR

SEMESTER-IV

Sr. No.	Course Code	Course Title	Hours per week			Credits	Continuous Evaluation	End Sem Exam	Total	ESE Duration (Hrs)
			L	T	P					
1	PCCAM401T	Discrete Mathematics & Graph Theory	3	1	0	4	40	60	100	3
2	PCCAM402T	Database Management System	3	0	0	3	40	60	100	3
3	PCCAM402P	Database Management System Lab	0	0	4	2	25	25	50	--
4	PCCAM403T	Computer Networks	3	0	0	3	40	60	100	3
5	PCCAM403P	Computer Networks Lab	0	0	2	1	25	25	50	--
6	PCCAM404T	Fundamentals of Artificial Intelligence & Machine Learning	3	0	0	3	40	60	100	3
7	PCCAM405P	Machine Learning Lab	0	0	2	1	25	25	50	--
8	PCCAM406P	Professional Skills Lab	0	0	2	1	25	25	50	--
9	HSMCAM401P	Soft Skills - I	0	0	2	1	25	25	50	--
10	OEC	**Open Elective-I**	3	0	0	3	40	60	100	3
		TOTAL	15	1	12	22	325	425	750	--

3rd YEAR

SEMESTER-V

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
1	PCCAM501T	Theory of Computation	3	1	0	4	40	60	100	3
2	PCCAM502T	Design & Analysis of Algorithms	3	0	0	3	40	60	100	3
3	PCCAM502P	Design & Analysis of Algorithms Lab	0	0	2	1	25	25	50	--
4	PCCAM503T	Software Engineering & Project Management	2	0	0	2	20	30	50	2
5	PCCAM503P	Software Engineering & Project Management Lab	0	0	4	2	25	25	50	--
6	PCCAM504T	Neural Network & Fuzzy Logic	2	0	0	2	20	30	50	2
7	HSMCAM501T	Economics and Finance for Engineers	2	0	0	2	20	30	50	2
8	HSMCAM502P	Soft Skills – II	0	0	2	1	25	25	50	--
9	OEC	**Open Elective – II**	3	0	0	3	40	60	100	3
10	PROJAM501	Practice School-II (Internship of 2-3 week)	-	-	-	1	During Summer Vacations after IV Semester			
		TOTAL	15	1	8	21	255	345	600	--

Scheme of Teaching & Examination of Bachelor of Technology V Semester B.Tech. (Artificial Intelligence and Machine Learning)

3rd YEAR

SEMESTER-VI

Scheme of Teaching & Examination of Bachelor of Technology VI Semester B.Tech. (Artificial Intelligence and Machine Learning)

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
1	PCCAM601T	Compiler Design	4	0	0	4	40	60	100	3
2	PCCAM602T	Deep Learning	3	0	0	3	40	60	100	3
3	PCCAM602P	Deep Learning Lab	0	0	2	1	25	25	50	--
4	PEC	Program Elective - I	3	0	0	3	40	60	100	3
5	PEC	Program Elective - I Lab	0	0	2	1	25	25	50	--
6	PEC	Program Elective-II	3	0	0	3	40	60	100	3
7	PEC	Program Elective-II Lab	0	0	2	1	25	25	50	--
8	HSMCAM601P	Soft Skills - III	0	0	2	1	25	25	50	--
9	PROJAM601	Mini Project	0	0	4	2	25	25	50	--
10	OEC	**Open Elective – III**	3	0	0	3	40	60	100	3
		TOTAL	**16**	**0**	**12**	**22**	**325**	**425**	**750**	--

Program Elective – I and Program Elective – I Lab

Sr. No	Course Code	Course Title
1	PECAM601T	Optimization Techniques in Machine Learning
	PECAM601P	Optimization Techniques in Machine Learning Lab
2	PECAM602T	Digital Image & Video Processing
	PECAM602P	Digital Image & Video Processing Lab
3	PECAM603T	Data Mining & Predictive Modeling
	PECAM603P	Data Mining & Predictive Modeling Lab

Program Elective – II and Program Elective – II Lab

Sr. No	Course Code	Course Title
1	PECAM604T	GPU Computing
	PECAM604P	GPU Computing Lab
2	PECAM605T	Computer Vision
	PECAM605P	Computer Vision Lab
3	PECAM606T	IoT & Machine Learning
	PECAM606P	IoT & Machine Learning Lab

4th YEAR

SEMESTER-VII

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
1	PEC	Program Elective-III	3	0	0	3	40	60	100	3
2	PEC	Program Elective-III Lab	0	0	2	1	25	25	50	--
3	PEC	Program Elective-IV	3	0	0	3	40	60	100	3
4	PEC	Program Elective-IV Lab	0	0	2	1	25	25	50	--
5	PEC	Program Elective-V	3	0	0	3	40	60	100	3
6	PEC	Program Elective-V Lab	0	0	2	1	25	25	50	--
7	PEC	Program Elective-VI	3	0	0	3	40	60	100	3
8	PEC	Program Elective-VI Lab	0	0	2	1	25	25	50	--
9	OEC	**Open Elective – IV**	3	0	0	3	40	60	100	3
10	PROJAM701	Practice School-III (Internship of 4-6 week)	-	-	-	2	During Summer Vacations after VI Semester			
11	PROJAM702	Project-I	0	0	8	4	75	75	150	--
		TOTAL	15	0	16	25	375	475	850	--

Scheme of Teaching & Examination of Bachelor of Technology VII Semester B.Tech. (Artificial Intelligence and Machine Learning)

Program Elective – III and Program Elective – III Lab

Sr. No.	Course Code	Course Title
1	PECAM701T	AI in Healthcare & Finance
	PECAM701P	AI in Healthcare & Finance Lab
2	PECAM702T	Pattern Recognition
	PECAM702P	Pattern Recognition Lab
3	PECAM703T	Cloud Computing
	PECAM703P	Cloud Computing Lab

Program Elective – IV and Program Elective – IV Lab

Sr. No.	Course Code	Course Title
1	PECAM704T	NLP for Indian Languages
	PECAM704P	NLP for Indian Languages Lab
2	PECAM705T	Information Retrieval
	PECAM705P	Information Retrieval Lab
3	PECAM706T	IoT and Security
	PECAM706P	IoT and Security Lab

Program Elective –V and Program Elective –V Lab

Sr. No.	Course Code	Course Title
1	PECAM707T	AI in Gaming
	PECAM707P	AI in Gaming Lab
2	PECAM708T	Text Processing
	PECAM708P	Text Processing Lab
3	PECAM709T	Time Series Analysis
	PECAM709P	Time Series Analysis Lab

Program Elective –VI and Program Elective –VI Lab

Sr. No.	Course Code	Course Title
1	PECAM710T	AI for Robotics
	PECAM710P	AI for Robotics Lab
2	PECAM711T	CNN for Visual Recognition
	PECAM711P	CNN for Visual Recognition Lab
3	PECAM712T	Robotics–Algorithms & Control
	PECAM712P	Robotics–Algorithms & Control Lab

4th YEAR

SEMESTER-VIII

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
		Scheme of Teaching & Examination of Bachelor of Technology VIII Semester B.Tech. (Artificial Intelligence and Machine Learning)								
1	PROJAM801	Project–II / Industry Internship	0	0	12	6	75	75	150	--
		TOTAL	0	0	12	6	75	75	150	--

21/07/22
Dr. M S Nimbarte

Dr. S B Bodkhe

Dr. R. Jain
21/7/22

S. R. Pradhan

S. A. Zunke
21/7/2022
(S. A. Zunke)

21/7/22
(A. R. Tayade)

Md. Arhan

R. K. Makhijani
21/7/22
R. K. Makhijani

Zoragh
21/7/22
H. D. Wagh

Shruti
(Shruti Jais)

LIST OF OPEN ELECTIVE COURSES
OFFERED BY
UNDER GRADUATE PROGRAMMES
WEF. 2022-23

OPEN ELECTIVE-I

SN	Semester	Offering Programme	Course Code	Course Name
1	IV	Computer Science and Engineering	OECCS401T	Digital Marketing
2	IV	Electronics and Telecommunication Engineering	OECET401T	Actuators and Sensors
3	IV	Mechanical Engineering	OECME401T	Energy Systems and Technologies
4	IV	Electrical Engineering	OECEE401T	Electric Utilities Fundamentals & Futures
5	IV	Artificial Intelligence and Machine Learning	OECAM401T	R-Programming
6	IV	Artificial Intelligence (AI) and Data Science	OECAD401T	Data Visualization

OPEN ELECTIVE-II

SN	Semester	Offering Programme	Course Code	Course Name
1	V	Computer Science and Engineering	OECCS501T	Java Script Programming
2	V	Electronics and Telecommunication Engineering	OECET501T	Wireless Sensor Networks
3	V	Mechanical Engineering	OECME501T	Optimization Techniques
4	V	Electrical Engineering	OECEE501T	Electrical Energy Conservation & Audit

OPEN ELECTIVE-III

SN	Semester	Offering Programme	Course Code	Course Name
1	VI	Computer Science and Engineering	OECCS601T	Basics of Computer Graphics
2	VI	Electronics and Telecommunication Engineering	OECET601T	System Design using Raspberry-Pi
3	VI	Mechanical Engineering	OECME601T	Smart Manufacturing Systems
4	VI	Electrical Engineering	OECEE601T	Solar Photovoltaic Systems

OPEN ELECTIVE-IV

SN	Semester	Offering Programme	Course Code	Course Name
1	VII	Computer Science and Engineering	OECCS701T	Mobile Application Development
2	VII	Electronics and Telecommunication Engineering	OECET701T	Internet of Things
3	VII	Mechanical Engineering	OECME701T	Automobile Engineering
4	VII	Electrical Engineering	OECEE701T	Electric Vehicles

CURRICULUM SCHEME
FOR
B.TECH. ARTIFICIAL INTELLIGENCE(AI) AND DATA SCIENCE

With Effect from Session 2022-2023

2nd YEAR

SEMESTER-III

Scheme of Teaching & Examination of Bachelor of Technology III Semester B.Tech. (Artificial Intelligence (AI) and Data Science)										
Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
1	BSCAD301T	Engineering Mathematics - III	3	1	0	4	40	60	100	3
2	PCCAD301T	Fundamentals of Digital Electronics & Computer Architecture	3	0	0	3	40	60	100	3
3	PCCAD302T	Data Structure & Algorithm	3	0	0	3	40	60	100	3
4	PCCAD302P	Data Structure & Algorithm Lab	0	0	2	1	25	25	50	--
5	PCCAD303T	Computer Networks	3	0	0	3	40	60	100	3
6	PCCAD303P	Computer Networks Lab	0	0	2	1	25	25	50	--
7	PCCAD304T	Database Management System	3	0	0	3	40	60	100	3
8	PCCAD304P	Database Management System Lab	0	0	4	2	25	25	50	--
9	PCCAD305P	Python Programming Lab	0	0	4	2	25	25	50	--
10	HSMCAD301T	Ethics for IT Engineers and IPR	2	0	0	2	20	30	50	2
11	MCAD301	Essence of Indian Traditional Knowledge	2	0	0	0	50	--	50	--
12	PROJAD301	Practice School-I (Internship of 1-2 week)	-	-	-	1	During Summer Vacations after II Semester			
		TOTAL	19	1	12	25	370	430	800	--

2ⁿᵈ YEAR

SEMESTER-IV

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
		Scheme of Teaching & Examination of Bachelor of Technology IV Semester B.Tech. (Artificial Intelligence (AI) and Data Science)								
1	PCCAD401T	Discrete Mathematics and Graph Theory	3	1	0	4	40	60	100	3
2	PCCAD402T	Operating System	4	0	0	4	40	60	100	3
3	PCCAD403T	Object Oriented Programming	3	0	0	3	40	60	100	3
4	PCCAD403P	Object Oriented Programming Lab	0	0	2	1	25	25	50	--
5	PCCAD404T	Fundamentals of Artificial Intelligence & Data Science	3	0	0	3	40	60	100	3
6	PCCAD405P	Data Science Lab	0	0	2	1	25	25	50	--
7	PCCAD406P	Professional Skills Lab	0	0	2	1	25	25	50	--
8	HSMCAD401P	Soft Skills - I	0	0	2	1	25	25	50	--
9	OEC	**Open Elective-I**	3	0	0	3	40	60	100	3
		TOTAL	16	1	08	21	300	400	700	--

3rd YEAR

SEMESTER-V

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
		Scheme of Teaching & Examination of Bachelor of Technology V Semester B.Tech. (Artificial Intelligence (AI) and Data Science)								
1	PCCAD501T	Theory of Computation	3	0	0	3	40	60	100	3
2	PCCAD502T	Design & Analysis of Algorithms	3	0	0	3	40	60	100	3
3	PCCAD502P	Design & Analysis of Algorithms Lab	0	0	2	1	25	25	50	--
4	PCCAD503T	Software Engineering & Project Management	2	0	0	2	20	30	50	2
5	PCCAD503P	Software Engineering & Project Management Lab	0	0	4	2	25	25	50	--
6	PCCAD504T	Data Analytics	2	0	0	2	20	30	50	2
7	PCCAD504P	Data Analytics Lab	0	0	2	1	25	25	50	--
8	HSMCAD501T	Economics and Finance for Engineers	2	0	0	2	20	30	50	2
9	HSMCAD502P	Soft Skills – II	0	0	2	1	25	25	50	--
10	OEC	**Open Elective – II**	3	0	0	3	40	60	100	3
11	PROJAD501	**Practice School-II (Internship of 2-3 week)**	-	-	-	1	During Summer Vacations after IV Semester			
		TOTAL	15	0	10	21	280	370	650	--

3rd YEAR

SEMESTER-VI

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
1	PCCAD601T	Compiler Design	4	0	0	4	40	60	100	3
2	PCCAD602T	Basics of Machine & Deep Learning	3	0	0	3	40	60	100	3
3	PCCAD602P	Basics of Machine & Deep Learning Lab	0	0	2	1	25	25	50	--
4	PEC	Program Elective - I	3	0	0	3	40	60	100	3
5	PEC	Program Elective - I Lab	0	0	2	1	25	25	50	--
6	PEC	Program Elective-II	3	0	0	3	40	60	100	3
7	PEC	Program Elective-II Lab	0	0	2	1	25	25	50	--
8	HSMCAD601P	Soft Skills - III	0	0	2	1	25	25	50	--
9	PROJAD601	Mini-Project	0	0	4	2	25	25	50	--
10	OEC	**Open Elective – III**	3	0	0	3	40	60	100	3
		TOTAL	16	0	12	22	325	425	750	--

Scheme of Teaching & Examination of Bachelor of Technology VI Semester B.Tech. (Artificial Intelligence (AI) and Data Science)

Program Elective – I and Program Elective – I Lab

Sr. No.	Course Code	Course Title
1	PECAD601T	Digital Image Processing
	PECAD601P	Digital Image Processing Lab
2	PECAD602T	Cyber Security
	PECAD602P	Cyber Security Lab
3	PECAD603T	GPU Computing
	PECAD603P	GPU Computing Lab

Program Elective – II and Program Elective – II Lab

Sr. No.	Course Code	Course Title
1	PECAD604T	NLP for Indian Languages
	PECAD604P	NLP for Indian Languages Lab
2	PECAD605T	Cryptography
	PECAD605P	Cryptography Lab
3	PECAD606T	Big Data Analytics and Business Intelligence
	PECAD606P	Big Data Analytics and Business Intelligence Lab

4th YEAR

SEMESTER-VII

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
1	PEC	Program Elective-III	3	0	0	3	40	60	100	3
2	PEC	Program Elective-III Lab	0	0	2	1	25	25	50	--
3	PEC	Program Elective-IV	3	0	0	3	40	60	100	3
4	PEC	Program Elective-IV Lab	0	0	2	1	25	25	50	--
5	PEC	Program Elective-V	3	0	0	3	40	60	100	3
6	PEC	Program Elective-V Lab	0	0	2	1	25	25	50	--
7	PEC	Program Elective-VI	3	0	0	3	40	60	100	3
8	PEC	Program Elective-VI Lab	0	0	2	1	25	25	50	--
9	OEC	**Open Elective – IV**	3	0	0	3	40	60	100	3
10	PROJAD701	Practice School-III (Internship of 4-6 week)	-	-	-	2	During Summer Vacations after VI Semester			
11	PROJAD702	Project-I	0	0	8	4	75	75	150	--
		TOTAL	15	0	16	25	375	475	850	--

Scheme of Teaching & Examination of Bachelor of Technology VII Semester B.Tech. (Artificial Intelligence (AI) and Data Science)

Program Elective – III and Program Elective – III Lab

Sr. No	Course Code	Course Title
1	PECAD701T	Cloud Computing
	PECAD701P	Cloud Computing Lab
2	PECAD702T	Applications of IoT & Security
	PECAD702P	Applications of IoT & Security Lab
3	PECAD703T	Data Science for NLP
	PECAD703P	Data Science for NLP

Program Elective – IV and Program Elective – IV Lab

Sr. No	Course Code	Course Title
1	PECAD704T	Information Retrieval
	PECAD704P	Information Retrieval Lab
2	PECAD705T	Bitcoins and Cryptocurrencies
	PECAD705P	Bitcoins and Cryptocurrencies Lab
3	PECAD706T	Data Science for Healthcare
	PECAD706P	Data Science for Healthcare Lab

Program Elective –V and Program Elective –V Lab

Sr. No	Course Code	Course Title
1	PECAD707T	CNN for Visual Recognition
	PECAD707P	CNN for Visual Recognition Lab
2	PECAD708T	Digital Forensic
	PECAD708P	Digital Forensic Lab
3	PECAD709T	Dockers and Kubernets
	PECAD709P	Dockers and Kubernets Lab

Program Elective –VI and Program Elective –VI Lab

Sr. No	Course Code	Course Title
1	PECAD710T	Time Series Analysis
	PECAD710P	Time Series Analysis Lab
2	PECAD711T	Data & Internet Security
	PECAD711P	Data & Internet Security Lab
3	PECAD712T	Computational Neuroscience
	PECAD712P	Computational Neuroscience Lab

4th YEAR

SEMESTER-VIII

Sr. No.	Course Code	Course Title	Hours per week			Credits	Maximum Marks			ESE
			L	T	P		Continuous Evaluation	End Sem Exam	Total	Duration (Hrs)
		Scheme of Teaching & Examination of Bachelor of Technology VIII Semester B.Tech. (Artificial Intelligence (AI) and Data Science)								
1	PROJAD801	Project–II / Industry Internship	0	0	12	6	75	75	150	--
		TOTAL	**0**	**0**	**12**	**6**	**75**	**75**	**150**	--

21/07/22
Dr. M S Nimbarte

BJ
21/7/22
Dr. R. Jain

21/7/2022
(S A Zeulke)

Md. Ashar

21/7/22
H R Wagh

Dr. S S Badhiye

R Malviya 21/07/22
Dr. Richa Malviya

S R Pradhan
21/1/22

A R Tayd
21/7/22

Shruti
(Shruti Jais)

LIST OF OPEN ELECTIVE COURSES
OFFERED BY
UNDER GRADUATE PROGRAMMES
WEF. 2022-23

OPEN ELECTIVE-I

SN	Semester	Offering Programme	Course Code	Course Name
1	IV	Computer Science and Engineering	OECCS401T	Digital Marketing
2	IV	Electronics and Telecommunication Engineering	OECET401T	Actuators and Sensors
3	IV	Mechanical Engineering	OECME401T	Energy Systems and Technologies
4	IV	Electrical Engineering	OECEE401T	Electric Utilities Fundamentals & Futures
5	IV	Artificial Intelligence and Machine Learning	OECAM401T	R-Programming
6	IV	Artificial Intelligence (AI) and Data Science	OECAD401T	Data Visualization

OPEN ELECTIVE-II

SN	Semester	Offering Programme	Course Code	Course Name
1	V	Computer Science and Engineering	OECCS501T	Java Script Programming
2	V	Electronics and Telecommunication Engineering	OECET501T	Wireless Sensor Networks
3	V	Mechanical Engineering	OECME501T	Optimization Techniques
4	V	Electrical Engineering	OECEE501T	Electrical Energy Conservation & Audit

OPEN ELECTIVE-III

SN	Semester	Offering Programme	Course Code	Course Name
1	VI	Computer Science and Engineering	OECCS601T	Basics of Computer Graphics
2	VI	Electronics and Telecommunication Engineering	OECET601T	System Design using Raspberry-Pi
3	VI	Mechanical Engineering	OECME601T	Smart Manufacturing Systems
4	VI	Electrical Engineering	OECEE601T	Solar Photovoltaic Systems

OPEN ELECTIVE-IV

SN	Semester	Offering Programme	Course Code	Course Name
1	VII	Computer Science and Engineering	OECCS701T	Mobile Application Development
2	VII	Electronics and Telecommunication Engineering	OECET701T	Internet of Things
3	VII	Mechanical Engineering	OECME701T	Automobile Engineering
4	VII	Electrical Engineering	OECEE701T	Electric Vehicles