



ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech. Scheme of Examination & Syllabus 2023-24

ARTIFICIAL INTELLIGENCE





ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY

ACCREDITED BY NAAC WITH 'A' Grade

PROGRAMME SCHEME & SYLLABI 2022 – 2023

B. Tech. (Artificial Intelligence)

		June 2023	1.1	Applicable for 2023-24
Chairman - BoS	Dean – Academics	Date of Release	Version	



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Scheme (I Sem to VIII Sem)

**ST. VINCENT PALLOTTI COLLEGE OF
ENGINEERING & TECHNOLOGY, NAGPUR**

TEACHING SCHEME FOR AUTONOMY

**FOUR YEAR BACHELOR OF ENGINEERING (B. Tech)
DEGREE COURSE**

BRANCH: ARTIFICIAL INTELLIGENCE

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ANNEXURE – I

ST VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY

Credit Structure for Undergraduate programs (Artificial Intelligence)

Sr. No	Category	Credits	AICTE Norms
1	Humanities, Social Sciences & Management courses	14	15
2	Basic Science courses	24	25
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	18	24
4	Professional core courses	59	48
5	Professional Elective courses relevant to chosen specialization/branch	20	18
6	Open subjects – Electives from other technical and /or emerging subjects	10	18
7	Project work, seminar and internship in industry or elsewhere	19	15
8	Mandatory Courses [Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Knowledge Tradition]	0	0
9	Comprehensive Courses [Industry Training and Skill Development, Capstone Course]	4	0
	TOTAL	168	

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**ANNEXURE – I****Teaching Scheme for First Year (Semester I and II)****Bachelor of Technology****GROUP 1: SEMESTER I / GROUP 2: SEMESTER II**

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AS101T	Engineering Physics & Material Sciences	4	1	-	5	30	70	100
2	AS101P	Engineering Physics & Material Sciences Lab	-	-	2	1	25	25	50
3	AS102T	Applied Mathematics – I	3	1	-	4	30	70	100
4	AS103T	Engineering Practices-I (Electrical & Electronics)	4	-	-	4	30	70	100
5	AS103P	Engineering Practices-I Lab(Electrical & Electronics)	-	-	2	1	25	25	50
6	AS104T	Logic building with C	3	-	-	3	30	70	100
7	AS104P	Logic building with C Lab	-	-	2	1	25	25	50
8	AS105T	Communication Skills-I	2	-	-	2	15	35	50
9	AS105P	Communication Skills-I Lab	-	-	2	1	25	25	50
10	AS106P	Sports & Yoga	-	-	2	0	-	-	-
11	AS107P	Skill development (Emerging technologies)	-	-	2	0	-	-	-
Total			16	2	12	22	235	415	650

***Induction Program - 3 weeks**

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**Teaching Scheme for First Year (Semester I and II)****Bachelor of Technology****GROUP 1: SEMESTER II / GROUP 2: SEMESTER I**

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AS201T	Engineering Chemistry & Environmental Science	4	1	-	5	30	70	100
2	AS201P	Engineering Chemistry & Environmental Science Lab	-	-	2	1	25	25	50
3	AS202T	Applied Mathematics – II	3	1	-	4	30	70	100
4	AS203T	Engineering Practices-II (Civil & Mechanical)	4	-	-	4	30	70	100
5	AS203P	Engineering Practices-II Lab (Civil & Mechanical)	-	-	2	1	25	25	50
6	AS204T	Problem Solving with Python	3	-	-	3	30	70	100
7	AS204P	Problem Solving with Python Lab	-	-	2	1	25	25	50
8	AS205T	Essence of Indian Knowledge Tradition	2	-	-	0	-	-	-
9	AS206T	Communication Skills-II	2	-	-	2	15	35	50
10	AS206P	Communication Skills-II Lab	-	-	2	1	25	25	50
11	AS207P	Tinkering & Model Lab	-	-	2	0	-	-	-
Total			18	2	10	22	235	415	650

*** Induction Program – 3 weeks**

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**III Semester**

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AS301T	Applied Mathematics – III	4	-	-	4	30	70	100
2	AI301T	Data Structures	4	-	-	4	30	70	100
3	AI301P	Data Structures Lab	-	-	2	1	25	25	50
4	AI302T	Fundamentals of Artificial Intelligence	3	1		4	30	70	100
5	AI302P	Fundamentals of Artificial Intelligence Lab	-	-	2	1	25	25	50
6	AI303T	Computer Networking	3	1	-	4	30	70	100
7	AI304P	Object Oriented Programming Lab	-	-	2	1	25	25	50
8	H 102	Universal Human Values – II	3	-	-	3	30	70	100
9	AI305T	Career Development- I	2	-	-	0	Audit		
Total			19	2	6	22	225	425	650

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Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AI401T	Data Engineering	4	-	-	4	30	70	100
2	AI402T	Data Base Management System	3	1	-	4	30	70	100
3	AI402P	Data Base Management System Lab	-	-	2	1	25	25	50
4	AI403T	AI Principles & Techniques	3	1	-	4	30	70	100
5	AI403P	AI Principles & Techniques Lab	-	-	2	1	25	25	50
6	AI404T	Software Engineering & Project Management	3	-	-	3	30	70	100
7	AI405P	Software Lab - 1	-	-	4	2	50	50	100
8	H103	Constitution of India	2	-	-	0	Audit		
9	AI402P	Technical Skill Development – I	-	-	2	1	50	--	50
10	AI403T	Career Development – II	2	-	-	0	Audit		
Total			17	2	10	20	270	380	650

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Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AI501T	Machine Learning	3		-	3	30	70	100
2	AI501P	Machine Learning Lab	-	-	2	1	25	25	50
3	AI502T	Design and analysis of Algorithm	3	-	-	3	30	70	100
4	AI502P	Design and analysis of Algorithm Lab	-	-	2	1	25	25	50
5	AI503T	Operating System	3	-	-	3	30	70	100
6	AI504T	Professional Elective - I	3		-	3	30	70	100
7	AS501T	Economics and Management	3	-	-	3	30	70	100
8	AI505T	Open Elective-I	3	-	-	3	30	70	100
9	AI506P	Technical Skill Development-II	-	-	2	1	50	-	50
10	AI507T	Career Development - III	2	-	-	0	Audit		
Total			20	0	6	21	280	470	750

AI504T	Professional Elective - I	AI505T	Open Elective-I
AI504T(i)	1. Human Computer Interaction	AI505T(i)	1. AI for everyone
AI504T(ii)	2. Edge AI	AI505T(ii)	2. Mobile Application Development
AI504T(iii)	3. Internet of Things		

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Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
2	AI601P	Natural Language Processing Lab	-	-	2	1	25	25	50
3	AI602T	Deep Learning	3	-	-	3	30	70	100
4	AI602P	Deep Learning Lab	-	-	2	1	25	25	50
5	AI603T	Professional Elective - II	3		-	3	30	70	100
6	AI604T	Professional Elective - III	3		-	3	30	70	100
7	AI605T	Open Elective-II	3	-	-	3	30	70	100
8	H104	Foundational Humanities Elective	2	-	-	-	Audit		
9	AS502T	English for Engineers	2	-	-	2	15	35	50
10	AI606P	Project – I	-	-	2	1	50	50	100
11	AI607T	Career Development - IV	2	-	-	0	Audit		
12	AI608P	Capstone Course – I **	-	-	2	1	25	25	50
Total			21	0	8	21	290	510	800

**** Capstone Course – I (Comprehensive knowledge gained in Artificial Intelligence Branch)**

AI605T	Open Elective - II	H104	Foundational Humanities Elective
AI605T(i)	Bitcoins & Cryptocurrencies	H-104(i)	Development of Societies
AI605T(ii)	Fundamentals of AI for Robotics	H-104(ii)	Philosophy

AI603T	Professional Elective - II	AI604T	Professional Elective - III
AI603T(i)	Fuzzy Logic	AI604T(i)	Big Data Visualization
AI603T(ii)	Edge Computing	AI604T(ii)	Genetic Algorithm
AI603T(iii)	ML for Cyber Security	AI604T(iii)	Cloud Computing

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VII Semester B. Tech. (Artificial Intelligence)

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		Total
			L	T	P		Continual Assessment	End Sem Examination	
1	AI701T	Expert Systems in Artificial Intelligence	3		-	3	30	70	100
2	AI702P	Software Lab - 2 (Emerging Technology Lab)	-	-	2	1	25	25	50
3	AI703T	Professional Elective - IV	3	-	-	3	30	70	100
4	AI703P	Professional Elective - IV Lab	-	-	2	1	25	25	50
5	AI704T	Professional Elective - V	3		-	3	30	70	100
6	AI705T	Open Elective - III	4	-	-	4	30	70	100
7	AI706P	Project – II	-	-	8	4	75	75	150
8	AS707	Summer / Winter Internship *	-	-		2	-	-	-
9	AS708P	Capstone Course – II **	-	-	2	1	25	25	50
Total			13	0	14	22	270	430	700

* Summer / Winter Internship (Evaluation of Four weeks Internship Completion till 6th Semester)

** Capstone Course – II (Comprehensive knowledge gained in Artificial Intelligence)

AI703T	Professional Elective - IV	AI703P	Professional Elective – IV Lab
AI703T(i)	Augmented Reality & Virtual Reality	AI703P(i)	Augmented Reality & Virtual Reality Lab
AI703T(ii)	Information Retrieval	AI703P(ii)	Information Retrieval Lab
AI703T(iii)	Computer Vision	AI703P(iii)	Computer Vision Lab

AI704T	Professional Elective - V	AI705T	Open Elective
AI704T(i)	AI in Health care Domain	AI705T(i)	GOOGLE Cloud Machine Learning Engine
AI704T(ii)	AI in Finance Domain	AI705T(ii)	Ethical Hacking
AI704T(iii)	AI in Engineering Domain		

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**Option A**

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Assessment	Total
1	AI801P	Project based on one semester internship in Industry/Research Institute/ National Laboratories/ Incubation Center	-	-	-	12	200	200	400
Total			-	-	-	12	200	200	400

*End Semester Examination will consist of evaluation of Seminar and Project Report

Option B is available to students only after recommendation of the concerned Head of the department. The project and internship should contribute towards career development plan of the students.

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Assessment	Total
1	AI802P	Institutional Internship	-	-	-	6	100	100	200
2	AI803P	Project - III	-	-	-	6	100	100	200
Total			-	-	-	12	200	200	400

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List of Open Elective

V Semester B.Tech.



Course Code	Open Elective – I
AI505T(i)	AI for everyone
AI505T(ii)	Mobile Application Development

VI Semester B.Tech.

Course Code	Open Elective – II
AI605T(i)	Bitcoins & Cryptocurrencies
AI605T(ii)	Fundamentals of AI for Robotics

VII Semester B.Tech.

Course code	Open Elective - III
AI705T(i)	GOOGLE Cloud Machine Learning Engine
AI705T(ii)	Ethical Hacking

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List of Professional Electives

V Semester B.Tech.

Course Code	Professional Elective – I
AI504T(i)	Human Computer Interaction
AI504T(ii)	Edge AI
AI504T(iii)	Internet of Things

VI Semester B.Tech.

Course code	Professional Elective – II
AI603T(i)	Fuzzy Logic
AI603T(ii)	Edge Computing
AI603T(iii)	ML for Cyber Security

Course code	Professional Elective – III
AI604T(i)	Big Data Visualization
AI604T(ii)	Genetic Algorithm
AI604T(iii)	Cloud Computing

VII Semester B.Tech.

Course code	Professional Elective – IV
AI703T(i)	Augmented Reality & Virtual Reality
AI703T(ii)	Information Retrieval
AI703T(iii)	Computer Vision

Course code	Professional Elective – V
AI704T(i)	AI in Health care Domain
AI704T(ii)	AI in Finance Domain
AI704T(iii)	AI in Engineering Domain

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**ST VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY**

Academic Year 2022-23

B. Tech. (Honors in Advances in Artificial Intelligence using Google Technologies)

Sem	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		Total
			L	T	P		Continual Assessment	End Sem Examination	
			IV	AIH501T	Artificial Intelligence Search Methods For Problem Solving		4	-	
V	AIH502T	Introduction to Artificial Intelligence (AI), Data Visualization with Python and R	4	-	-	4	30	70	100
VI	AIH603T	How Google does Machine Learning, Launching into Machine Learning	4	-	-	4	30	70	100
VII	AIH704T	Introduction to TensorFlow, Feature Engineering	4	-	-	4	30	70	100
VIII	AIH805T	Art and Science of Machine Learning, Google Cloud Big Data and Machine Learning Fundamentals, Business Transformation with Google Cloud, Infrastructure and Application Modernization with Google Cloud, Managing Machine Learning Projects with Google Cloud	4	-	-	4	30	70	100
Total			20	-	-	20	150	350	500

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**ST VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY**

Academic Year 2022-23

B. Tech. (Minor in Artificial Intelligence)

Sem	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		Total
			L	T	P		Continual Assessment	End Sem Examination	
IV	AIM403T	AI Principles & Techniques	3	-	-	3	30	70	100
IV	AIM403P	AI Principles & Techniques Lab	-	-	2	1	25	25	50
V	AIM501T	Machine Learning	3	-	-	3	30	70	100
V	AIM501P	Machine Learning Lab	-	-	2	1	25	25	50
VI	AIM601T	Natural Language Processing	3	-	-	3	30	70	100
VI	AIM601P	Natural Language Processing lab	-	-	2	1	25	25	50
VII	AIM704T	AI in Health care Domain	4	-	-	4	30	70	100
VIII	AIM801T	Data Analysis & Visualization Tools	4	-	-	4	30	70	100
Total			17	-	6	20	225	425	650

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