



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

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

## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25

### ANNEXURE – I

#### Credit Structure for Undergraduate programs

Sr. No.	Category Code	Category	Credits
1	HSSM	Ability Enhancement Course (AEC), Indian Knowledge System (IKS), Value Education Course (VEC), Entrepreneurship/Economics/Management courses	10
2	BSC	Basic Science courses	14
3	ESC	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	14*
4	PCC	Professional core courses	72*
5	PEC	Professional Elective courses relevant to chosen specialization/branch	
6	OE	Open subjects – Electives from other technical and /or emerging subjects	08
7	ELC	Project work, seminar and internship in industry or elsewhere, Industry Training and Skill Development, Capstone Course	20*
8	VSEC	Vocations Skill Courses (VSC) , Skill Enhancement Courses(SEC)	10
9	CC	Co-curricular Courses (CC) such as Health and Wellness, Yoga education sports, and fitness, Cultural Activities, NSS/NCC and Fine/ Applied/ Visual/ Performing Arts	04
10	MDM	Compulsory Multidisciplinary Minor	14
		TOTAL	166*

		July 2025	2.0	Applicable for 2024-25
Chairman - BoS	Dean – Academics	Date of Release	Version	



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## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25

### GROUP 1- SEMESTER I

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No of Hours
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	BSC	24AI101T	Engineering Chemistry and Environmental Science	2	0	-	2	10	10	30	50	1.5
2.	BSC	24AI101P	Engineering Chemistry and Environmental Science Lab	-	-	2	1	-	25	25	50	
3.	BSC	24AI102T	Linear Algebra and Calculus	3	1	-	4	20	20	60	100	3
4.	ESC	24AI103T	Logic Building and Problem Solving	3	1	-	4	20	20	60	100	3
5.	ESC	24AI103P	Logic Building and Problem-Solving Lab	-	-	2	1	-	25	25	50	
6.	PCC	24AI104T	Introduction to AI	2		-	2	10	10	30	50	1.5
7.	PCC	24AI105P	AI Workshop – I (MATLAB for AI)	-	-	4	2	-	25	25	50	-
8.	AEC	24AI106P	Business Communication Skills I Lab	-	-	2	1	-	25	25	50	-
9.	IKS	24AI107T	Indian Knowledge Systems	2	-	-	2	10	10	30	50	1.5
10	SEC	24AI141P	Career Development I	-	-	2	1	-	50	-	50	-
11	CC	24AI108T	Co-curricular Courses - I	2	-	-	2	-	50	-	50	-
<b>Total</b>				<b>14</b>	<b>2</b>	<b>12</b>	<b>22</b>	<b>70</b>	<b>270</b>	<b>310</b>	<b>650</b>	

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Chairman - BoS	Dean – Academics	Date of Release	Version	



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## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25

### GROUP 1 : SEMESTER II

SrNo	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Duration No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	BSC	24ES201T	Engineering Physics and Materials Science	2	0	-	2	10	10	30	50	1.5
2.	BSC	24ES201P	Engineering Physics and Materials Science Lab	-	-	2	1	-	25	25	50	-
3.	BSC	24ES202T	Statistics and Probability	3	1	-	4	20	20	60	100	3
4.	ESC	24ES212T	Digital Logic and Computer Architecture	3		-	3	20	20	60	100	3
5.	PCC	24AI213T	Foundation of Data Analysis	3	1	-	4	20	20	60	100	3
6.	PCC	24AI214T	Foundation of Data Analysis Lab	-	-	2	1	-	25	25	50	1.5
7.	PCC	24AI214P	AI Workshop – II (Python Programming)	-	-	2	1	-	25	25	50	-
8.	AEC	24ES203P	Business Communication Skills II Lab	-	-	2	1	-	25	25	50	-
9.	ESC	24ES204T	Design Thinking	2	-	1	1	10	10	30	50	1.5
10.	SEC	24AI241P	Career Development II	-	-	2	2	-	50	-	50	-
11.	CC	24ES205T	Co-curricular Courses - II	2	-	-	2	-	50	-	50	-
<b>Total</b>				<b>15</b>	<b>2</b>	<b>11</b>	<b>22</b>	<b>80</b>	<b>280</b>	<b>340</b>	<b>700</b>	

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## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25

### SEMESTER III

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	PCC	24AS301T	Discrete Mathematics	3	-	-	3	20	20	60	100	3
2.	PCC	24AI301T	Data Structures	3	-	-	3	20	20	60	100	3
3.	PCC	24AI301P	Data Structures Laboratory	-	-	2	1	-	25	25	50	-
4.	PCC	24AI302T	Fundamentals of Artificial Intelligence	3	-	-	3	20	20	60	100	3
5.	PCC	24AI302P	Fundamentals of Artificial Intelligence Laboratory	-	-	2	1	-	25	25	50	-
6.	PCC	24AI303T	Database management System	3	-	-	3	20	20	60	100	3
7.	PCC	24AI303P	Database Management System Laboratory	-	-	2	1	-	25	25	50	-
8.	ELC	24ES301T	Value Education Course	3	-	-	3	20	20	60	100	3
9.	MDM	24AI331M	MDM-I (Refer MDM Basket)	2	-	-	2	10	10	30	50	1.5
10.	SEC	24AI341P	Career Development III	-	-	2	1	-	50	-	50	-
11.	ELC	24AI307P	Micro Project I*	-	-	2	1	-	50	--	50	-
<b>Total</b>				<b>17</b>	<b>0</b>	<b>10</b>	<b>22</b>	<b>110</b>	<b>285</b>	<b>405</b>	<b>800</b>	

\* Field Project or Community engagement project in the major discipline

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Chairman - BoS	Dean – Academics	Date of Release	Version	



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

## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25

### SEMESTER IV

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	PCC	24AI401T	Numerical Methods and Optimization	3	-	-	3	20	20	60	100	3
2.	PCC	24AI402T	Design and Analysis of Algorithms	3	-	-	3	20	20	60	100	3
3.	PCC	24AI402P	Design and Analysis of Algorithms Laboratory	-	-	2	1	-	25	25	50	-
4.	PCC	24AI403P	Object Oriented Programming Laboratory	-	-	2	1	-	25	25	50	-
5.	PCC	24AI404P	Web Programming for AI	--	-	4	2	-	25	25	50	-
6.	MDM	24AI431M	MDM-II (Refer MDM Basket)	3	-	-	3	20	20	60	100	3
7.	VSC	24AI406T	Technical Skill Development - I	2	-	-	2	-	50	-	50	-
8.	AEC	24ES401T	Economics. & Management	3	-	-	3	20	20	60	100	3
9.	SEC	24AI441P	Career Development - IV	-	-	2	1	-	50	-	50	-
10.	ELC	24AI407P	Micro Project II*	-	-	2	1	-	50	-	50	-
<b>Total</b>				<b>14</b>	<b>0</b>	<b>12</b>	<b>20</b>	<b>80</b>	<b>305</b>	<b>315</b>	<b>700</b>	

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		July 2025	2.0	Applicable for 2024-25
Chairman - BoS	Dean – Academics	Date of Release	Version	



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## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25

### SEMESTER V

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No of Hours for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	PCC	24AI501T	Machine Learning	3	-	-	3	20	20	60	100	3
2.	PCC	24AI501P	Machine Learning Laboratory	-	-	2	1	-	25	25	50	-
3.	PCC	24AI502T	Software Engineering & Project management	3	-	-	3	20	20	60	100	3
4.	PCC	24AI502P	Software Engineering & Project management Laboratory	-	-	2	1	-	25	25	50	-
5.	PCC	24AI503T	Operating Systems	3	-	-	3	20	20	60	100	3
6.	PCC	24AI504T	Computer Networks	3	-	-	3	20	20	60	100	3
7.	MDM	24AI531M	MDM – III (Refer MDM Basket)	3	-	-	3	20	20	60	100	3
8.	VSC	24AI506P	Technical Skill Development - II	2	-	-	2	-	50	-	50	-
9.	SEC	24AI541P	Career Development - V	-	-	2	1	-	50	-	50	-
<b>Total</b>				<b>17</b>	<b>0</b>	<b>6</b>	<b>20</b>	<b>100</b>	<b>250</b>	<b>350</b>	<b>700</b>	

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Chairman - BoS	Dean – Academics	Date of Release	Version	



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## B. Tech. Artificial Intelligence

### Scheme of Examination & Syllabus 2024-25

#### SEMESTER VI

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No of Hours for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	PCC	24AI601T	Deep Learning	3	-	-	3	20	20	60	100	3
2.	PCC	24AI601P	Deep Learning Laboratory	-	-	2	1	-	25	25	50	-
3.	PCC	24AI602T	Cloud Computing	3	-	-	3	20	20	60	100	3
4.	PCC	24AI602P	Cloud Computing Laboratory	-	-	2	1	-	25	25	50	-
5.	PCC	24AI603T	Theory of Computation	3	-	-	3	20	20	60	100	3
6.	PCC	24AI604P	Core Java Programming Laboratory	-	-	2	1	-	25	25	50	-
7.	MDM	24AI631M	MDM – IV (Refer MDM Basket)	3	-	-	3	20	20	60	100	3
8.	OE	24AI661O	Open Elective – I	2	-	-	2	10	10	30	50	1.5
9.	ELC	24AI605P	Project - I	-	-	4	2	-	50	50	100	-
10.	SEC	24AI641P	Career Development - VI	-	-	2	1	-	50	-	50	-
<b>Total</b>				<b>14</b>	<b>0</b>	<b>12</b>	<b>20</b>	<b>90</b>	<b>265</b>	<b>395</b>	<b>750</b>	

#### Open Elective - I

24AI661O(i) Introduction to Artificial Intelligence

24AI661O(ii) Natural Language Processing

		July 2025	2.0	Applicable for 2024-25
Chairman - BoS	Dean – Academics	Date of Release	Version	



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## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25

### SEMESTER VII

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No of Hours for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	PCC	24AI701T	Natural Language Processing	3	-	-	3	20	20	60	100	3
2.	PCC	24AI701P	Natural Language Processing Laboratory	-	-	2	1	-	25	25	50	-
3.	PCC	24AI702T	Professional Elective-I	3	-	-	3	20	20	60	100	3
4.	PCC	24AI703T	Professional Elective-II	3	-	-	3	20	20	60	100	3
5.	PCC	24AI703P	Professional Elective-II Laboratory	-	-	2	1	-	25	25	50	-
6.	PCC	24AI704P	AI Workshop III (AI tools and Platform)	-	-	2	1	-	25	25	50	-
7.	OE	24AI761O	Open Elective- II	3	-	-	3	20	20	60	100	3
8.	MDM	24AI731M	MDM-V (Refer MDM Basket)	3	-	-	3	20	20	60	100	3
9.	ELC	24AI705P	Project - II	-	-	4	2	-	50	50	100	-
<b>Total</b>				<b>15</b>	<b>0</b>	<b>10</b>	<b>20</b>	<b>100</b>	<b>225</b>	<b>425</b>	<b>750</b>	

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

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## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25

Professional Elective - I	
24AI702T(i)	Computer vision
24AI702T(ii)	Internet of Things
24AI702T(iii)	AI for Cyber security

Professional Elective - II	
24AI703P(i)	Foundation of Generative AI & LLM
24AI703P(ii)	Reinforcement learning
24AI802P(iii)	Big Data Analytics

Professional Elective – II (Laboratory)	
24AI703P(i)	Foundation of Generative AI & LLM Laboratory
24AI703P(ii)	Reinforcement learning Laboratory
24AI802P(iii)	Big Data Analytics Laboratory

Open Elective- II	
24AI7611O(i)	Introduction to Machine Learning
24AI761O(ii)	Data Mining & Information Retrieval

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### SEMESTER VIII

#### Option A

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks			No of Hours for ESE
				L	T	P		Continual Assessment	End Sem Examination	Total	
1	ELC	24ES801T	Research Methodology <sup>#</sup>	2			2	20	30	50	1.5
2	PEC	24AI802T	Professional Elective III	3			3	40	60	100	3
3	OE	24AI803T	Open Elective - III <sup>#</sup>	3			3	40	60	100	3
4	ELC	24AI804P(i)	Industry/Research Internship <sup>*</sup>	-	-	-	12	300	100	400	-
<b>Total</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>300</b>	<b>100</b>	<b>400</b>	

#### Option B

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks			No of Hours for ESE
				L	T	P		Continual Assessment	End Sem Examination	Total	
1	ELC	24ES801T	Research Methodology <sup>#</sup>	2			2	20	30	50	1.5
2	PEC	24AI802T	Professional Elective III	3			3	40	60	100	3
3	OE	24AI803T	Open Elective – III <sup>#</sup>	3			3	40	60	100	3
4	ELC	24AI804P(i)	Institutional Internship <sup>§</sup> & Project III	-	-	24	12	300	100	400	-
<b>Total</b>				<b>0</b>	<b>0</b>	<b>24</b>	<b>20</b>	<b>300</b>	<b>100</b>	<b>400</b>	

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.

<sup>#</sup> Courses to be mapped with NPTEL/SWAYAM/MOOC offered course in that semester

<sup>\*</sup> Minimum 90 days internship in any industry and project is to be carried out during internship.

<sup>§</sup> Two NPTEL courses (as per choice of student) or Institutional Internship by IEDC, SVP CET.

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## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25

Professional Elective - III	
24AI802T(i)	Blockchain Technology
24AI802T(ii)	Responsible & safe AI systems
24AI802T(iii)	Edge AI

Open Elective - III	
24AI803T(i)	Foundation of Deep Learning
24AI803T(ii)	Pattern Recognition

### MDM Basket

Course Category	Course Code	Course Title
MDM I	24AI331M	Responsible AI
MDM II	24AI431M	Data Centric AI
MDM III	24AI531M	Explainable AI
MDM IV	24AI631M	AI in engineering Systems
MDM V	24AI731M	Expert Systems for Artificial Intelligence

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## B. Tech. Artificial Intelligence Scheme of Examination & Syllabus 2024-25



### EXIT OPTIONS

**Award of UG Certificate in Major with 44 credits and an additional 8 credits (After First Year)**

EXIT COURSES			
S.N.	Course name	Mode of conduction	Credits
1	Mastering Office	Online	4
2	Programming in C++	Online	4
3	Professionalism in the Tech Industry	Online	4
4	Web Development	Online	4

**Award of UG Diploma in Major with 86 credits and an additional 8 credits (After Second Year)**

EXIT COURSES			
S.N.	Course name	Mode of conduction	Credits
1	Machine Learning with Python	Online	4
2	Deep Learning	Online	4
3	Software Testing	Online	4

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**Award of UG Degree in Major with 126 credits and an additional 8 credits (After Third Year)**

EXIT COURSES			
S.N.	Course name	Mode of conduction	Credits
1	Cyber Security	Online	4
2	Agile Software Development	Online	4
3	Cloud Computing	Online	4

**Note: - Any 2 courses with 4 credits each during exit from the program.**

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