



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

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



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

### INDUSTRIAL IoT

#### 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.	10
4	PCC	Professional core courses	76
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

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### INDUSTRIAL IoT

#### SEMESTER-I

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of hours for ESE
				L	T	P		Mid Sem Exam	Continuous Assessment	End Sem Examination	Total	
1	BSC	24ES211T	Applied Physics	2	0	-	2	10	10	30	50	1.5
2	BSC	24ES211P	Applied Physics Lab	-	-	2	1	-	25	25	50	-
3	BSC	24ES102T	Linear Algebra & Calculus	3	1	-	4	20	20	60	100	03
4	ESC	24II101T	C Programming	3	-	-	3	20	20	60	100	03
5	ESC	24II101P	C Programming Lab	-	-	2	1	-	25	25	50	-
6	PCC	24II102T	Basic Electrical & Electronics Engineering	3	1	-	4	20	20	60	100	03
7	PCC	24II102P	Basic Electrical & Electronics Engineering Lab	-	-	2	1	-	25	25	50	-
8	AEC	24ES103P	Business Communication Skills - I Lab	-	-	2	1	-	25	25	50	-
9	ESC	24ES203T	Design Thinking	2	-	-	2	10	10	30	50	1.5
10	SEC	24II141P	Career Development - I	-	-	2	1	-	50	-	50	-
11	CC	24ES105T	Co-curricular Courses - I	2	-	-	2	-	50	-	50	-
<b>Total</b>				<b>15</b>	<b>2</b>	<b>10</b>	<b>22</b>	<b>80</b>	<b>280</b>	<b>340</b>	<b>700</b>	

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### INDUSTRIAL IoT

#### SEMESTER II

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of hours for ESE
				L	T	P		Mid Sem Exam	Continual Assessment	End Sem Examination	Total	
1	BSC	24ES111T	Applied Chemistry	2	-	-	2	10	10	30	50	1.5
2	BSC	24ES111P	Applied Chemistry Lab	-	-	2	1	-	25	25	50	-
3	BSC	24ES212T	Statistics & Transforms	3	1	-	4	20	20	60	100	03
4	PCC	24II201T	Digital Circuits	3	1	-	4	20	20	60	100	03
5	PCC	24II201P	Digital Circuits Lab	-	-	2	1	-	25	25	50	-
6	ESC	24II202T	Python Programming	3	-	-	3	20	20	60	100	03
7	ESC	24II202P	Python Programming Lab	-	-	2	1	-	25	25	50	--
8	AEC	24ES203P	Business Communication Skills - II Lab	-	-	2	1	-	25	25	50	-
9	IKS	24ES104T	Indian Knowledge Systems	2	-	-	2	10	10	30	50	1.5
10	SEC	24II241P	Career Development -II	-	-	2	1	-	-	50	-	-
11	CC	24ES105T	Co-curricular Courses – I	2	-	-	2	-	50	-	50	-
<b>Total</b>				<b>15</b>	<b>2</b>	<b>10</b>	<b>22</b>	<b>80</b>	<b>230</b>	<b>390</b>	<b>650</b>	

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### INDUSTRIAL IoT

#### SEMESTER III

Sr. No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of hours for ESE
				L	T	P		Mid Sem Exam	Continual Assessment	End Sem Examination	Total	
1	PCC	24II301T	Object Oriented Programming & Data Structures	3	1	-	4	20	20	60	100	03
2	PCC	24II301P	Object Oriented Programming & Data Structures Lab	-	-	4	2	-	25	25	50	-
3	PCC	24II302T	Analog & Digital Communication	3	1	-	4	20	20	60	100	03
4	PCC	24II302P	Analog & Digital Communication Lab	-	-	2	1		25	25	50	-
5	PCC	24II303T	Mechatronics	3	-	-	3	20	20	60	100	03
6	PCC	24II303P	Mechatronics Lab	-	--	2	1		25	25	50	-
7	MDM	24II331M	Multidisciplinary Minor – I (Refer MDM Basket)	2	-	-	2	10	10	30	50	1.5
8	AEC	24ES401T	Economics & Management	3	-	-	3	20	20	60	100	03
9	SEC	24II341P	Career Development - III	-	-	2	1	-	50	-	50	-
10	ELC	24II304P	Micro Project I*	-	-	2	1	-	50	-	50	-
<b>Total</b>				<b>14</b>	<b>2</b>	<b>12</b>	<b>22</b>	<b>90</b>	<b>265</b>	<b>345</b>	<b>700</b>	

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

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### INDUSTRIAL IoT

#### SEMESTER IV

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of hours for ESE
				L	T	P		Mid Sem Exam	Continual Assessment	End Sem Examination	Total	
1.	PCC	24II401T	Microprocessors & Microcontrollers	3	-	-	3	20	20	60	100	03
2.	PCC	24II401P	Microprocessors & Microcontrollers Lab	-	-	2	1	-	25	25	50	-
4.	PCC	24II402T	IoT Protocols & Architecture	3	-	-	3	20	20	60	100	03
5.	PCC	24II402P	IoT Protocols & Architecture Lab	-	-	2	1	-	25	25	50	-
5.	PCC	24II403T	Computer Networks	2	-	-	2	20	20	60	100	03
6.	MDM	24II431M	Multidisciplinary Minor – II (Refer MDM Basket)	3	-	-	3	20	20	60	100	03
7.	VSC	24II404T	Technical Skill Development - I	2	-	-	2	-	50	-	50	-
8.	VEC	24ES301T	Value Education Course	3			3	20	20	60	100	03
9.	SEC	24II441P	Career Development - IV	-	-	2	1	-	50	-	50	-
10.	ELC	24II405P	Micro Project II*	-	-	2	1	-	50	-	50	-
<b>Total</b>				<b>16</b>		<b>8</b>	<b>20</b>	<b>100</b>	<b>300</b>	<b>350</b>	<b>750</b>	<b>15</b>

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

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### INDUSTRIAL IoT

#### SEMESTER V

SrNo	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of hours for ESE
				L	T	P		Mid Sem Exam	Continual Assessment	End Sem Examination	Total	
1.	PCC	24II501T	Operating Systems	3	-	-	3	20	20	60	100	03
2.	PCC	24II502T	Embedded Systems for IoT	3	-	-	3	20	20	60	100	03
3.	PCC	24II502P	Embedded Systems for IoT Lab	-	-	2	1	-	25	25	50	-
4.	PCC	24II503T	Database Management Systems	3	-	-	3	20	20	60	100	03
5.	PCC	24II503P	Database Management Systems Lab	-	-	2	1	-	25	25	50	-
6.	PEC	24II504T	Professional Elective – I (Refer PE Basket)	3	-	-	3	20	20	60	100	03
7.	MDM	24II531M	Multidisciplinary Minor – III (Refer MDM Basket)	3	-	-	3	20	20	60	100	03
8.	VSC	24II505T	Technical Skill Development – II	2	-	-	2	-	50	-	50	-
9.	SEC	24II541P	Career Development - V	-	-	2	1	-	50	-	50	-
<b>Total</b>				<b>17</b>		<b>6</b>	<b>20</b>	<b>100</b>	<b>250</b>	<b>350</b>	<b>700</b>	<b>15</b>

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#### SEMESTER VI

SrNo	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of hours for ESE
				L	T	P		Mid Sem Exam	Continual Assessment	End Sem Examination	Total	
1.	PCC	24II601T	Foundations of Data Science	3	-	-	3	20	20	60	100	03
2.	PCC	24II601P	Foundations of Data Science Lab	-	-	2	1	-	25	25	50	-
3.	PCC	24II602T	Cloud & Fog Computing	3	-	-	3	20	20	60	100	03
4.	PCC	24II602P	Cloud & Fog Computing Lab	-	-	2	1	-	25	25	50	-
5.	PCC	24II603P	Industrial IoT Lab	-	-	4	2	-	25	25	50	-
6.	PEC	24II604T	Professional Elective – II (Refer PE Basket)	3	-	-	3	20	20	60	100	03
7.	MDM	24II631M	Multidisciplinary Minor – IV (Refer MDM Basket)	3	-	-	3	20	20	60	100	03
8.	OE	24II661O	Open Elective- I (Refer OE Basket)	2	-	-	2	10	10	30	50	1.5
9.	ELC	24II605P	Project – I	-	-	2	1	-	50	50	100	-
10.	SEC	24II641P	Career Development - VI	-	-	2	1	-	50	-	50	-
<b>Total</b>				<b>14</b>		<b>12</b>	<b>20</b>	<b>90</b>	<b>265</b>	<b>395</b>	<b>750</b>	<b>13.5</b>

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#### SEMESTER VII

SrNo	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of hours for ESE
				L	T	P		Mid Sem Exam	Continual Assessment	End Sem Examination	Total	
1.	PCC	24II701T	Industrial Automation	3	-	-	3	20	20	60	100	03
2.	PCC	24II701P	Industrial Automation Lab	-	-	2	1	-	25	25	50	-
3.	PCC	24II702T	Machine Learning	3	-	-	3	20	20	60	100	03
4.	PCC	24II702P	Machine Learning Lab	-	-	2	1	-	25	25	50	-
5.	PEC	24II703T	Professional Elective – III (Refer PE Basket)	3	-	-	3	20	20	60	100	03
6.	OE	24II761O	Open Elective- II (Refer OE Basket)	3	-	-	3	20	20	60	100	03
7.	MDM	24II731M	Multidisciplinary Minor – V (Refer MDM Basket)	3	-	-	3	20	20	60	100	03
8.	ELC	24II704P	Project – II	-	-	6	3	-	50	50	100	-
<b>Total</b>				<b>15</b>		<b>10</b>	<b>20</b>	<b>100</b>	<b>200</b>	<b>400</b>	<b>700</b>	<b>15</b>

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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	24II802T	Professional Elective <sup>#</sup>	3			3	40	60	100	3
3	OE	24II803T	Open Elective - III <sup>#</sup>	3			3	40	60	100	3
4	ELC	24II804P(i)	Industry/Research Internship*	-	-	-	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>	<b>7.5</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	24II802T	Professional Elective <sup>#</sup>	3			3	40	60	100	3
3	OE	24II803T	Open Elective – III <sup>#</sup>	3			3	40	60	100	3
4	ELC	24II804P(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>	<b>7.5</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

\* 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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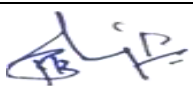
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**INDUSTRIAL IoT**

**Basket for Multi-Disciplinary Minor Courses (MDM)**

**A. INDUSTRIAL IoT**

<b>Semester</b>	<b>Course Category</b>	<b>Course Code</b>	<b>Name of Course</b>
III	MDM - I	24II331M	Microcontrollers: Arduino Playground
IV	MDM - II	24II431M	Introduction to IoT
V	MDM - III	24II531M	IoT Connectivity and Communication Protocols
VI	MDM - IV	24II631M	Fundamentals of Automation
VII	MDM - V	24II731M	Fundamentals of Industry 4.0 and Industrial IoT

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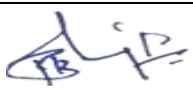
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**INDUSTRIAL IoT**

**Basket for Program Elective Courses (PEC)**

**B. INDUSTRIAL IoT**

Semester	Course Category	Course Code	Name of Course
V	PEC	24II504T(i)	Robotics
V	PEC	24II504T(ii)	Signal Processing
VI	PEC	24II604T (i)	Computer Architecture & Organization
VI	PEC	24II604T (ii)	Control Systems
VII	PEC	24II703T(i)	Dashboard and Mobile Application Development
VII	PEC	24II703T (ii)	Artificial Intelligence
VIII	PEC	24II802T (i)	Industrial Robotics
VIII	PEC	24II802T (ii)	Foundations of Virtual Reality
VIII	PEC	24II802T (iii)	Cyber Security and Privacy

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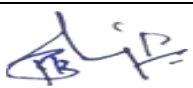
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**INDUSTRIAL IoT**

**Basket for Open Elective Courses (OE)**

**C. INDUSTRIAL IoT**

Semester	Course Category	Course Code	Name of Course
VI	OE	24II561O (i)	Fundamentals of 3D Printing
VI	OE	24II561O (ii)	Introduction to IoT
VII	OE	24II661O (i)	Fundamentals of Industrial Automation
VII	OE	24II661O (ii)	Fundamentals of Industry 4.0 and Industrial IoT
VIII	OE	24II803T (i)	Foundations of Virtual Reality
VIII	OE	24II803T (ii)	Cyber Security and Privacy

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#### 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.	Internship	Online/Offline	8

**Award of UG Diploma in Major with 66 credits and an additional 8 credits (After Second Year)**

EXIT COURSES			
S.N.	Course name	Mode of conduction	Credits
1.	Internship	Online/Offline	8

**Award of UG Degree in Major with 88 credits and an additional 8 credits (After Third Year)**

EXIT COURSES			
S.N.	Course name	Mode of conduction	Credits
1.	Internship	Online/Offline	8

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