



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

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

## B. Tech. Scheme of Examination & Syllabus 2025-26

### INDUSTRIAL IoT

#### SEMESTER III

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Minimum Passing Marks	No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1.	PCC	25II301T	Microprocessors and Microcontrollers	3	-	-	3	20	20	60	100	45	3
2.	PCC	25II301P	Microprocessors and Microcontrollers Lab	-	-	2	1	-	25	25	50	25	-
3.	PCC	25II302T	Signals and Systems	2	-	-	2	10	10	30	50	23	1.5
4.	PCC	25II303T	Analog and Digital Communication	2	-	-	2	10	10	30	50	23	1.5
5.	PCC	25II304P	Signals, Systems and Communication Lab	-	-	2	1	-	25	25	50	25	-
6.	PCC	25II305T	Mechatronics	3	-	-	3	20	20	60	100	45	3
7.	PCC	25II305P	Mechatronics Lab	-	-	2	1	-	25	25	50	25	-
8.	VEC	25II306T	Environmental Science	2	-	-	2	10	10	30	50	23	1.5
9.	HSSM	25II307T	Fundamentals of Economics and Management	2	-	-	2	10	10	30	50	23	1.5
10.	SEC	25II341P	Career Development - I	-	-	2	1	-	50	-	50	25	-
11.	MDM	25II331M	MDM - I# (Refer MDM basket)	2	-	-	2	10	10	30	50	23	1.5
<b>Total</b>				<b>16</b>		<b>08</b>	<b>20</b>	<b>90</b>	<b>215</b>	<b>345</b>	<b>650</b>		

# - Course is to be taken online through NPTEL

Multidisciplinary Minor - I	
25II331M	Sensor Technologies: Physics, Fabrication, and Circuits

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	



**ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR**  
(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech. Scheme of Examination & Syllabus 2025-26**

**INDUSTRIAL IoT**

**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25II301T	Microprocessors and Microcontrollers	3	-	-	3				
						20	20	60	100

Course Objectives	Course Outcomes
To impart a comprehensive understanding of architecture, programming and peripheral interfacing of Microprocessors & Microcontrollers and their application in embedded systems	<ol style="list-style-type: none"> <li>1. Explain architecture and operation of Intel 8086 microprocessor including timing and interrupts.</li> <li>2. Apply 8086 instruction set and addressing modes for programming and interfacing.</li> <li>3. To explain the concept of internal architecture, Memory organization and Instruction set of 8051 microcontroller.</li> <li>4. To develop assembly language program and embedded C program for 8051 microcontrollers</li> <li>5. To illustrate the Interfacing of 8051 with different peripheral devices.</li> </ol>

<b>Unit I</b>	<b>[9Hrs]</b>
Introduction to Microprocessor, Bus structure, Introduction to 8086 Microprocessor, pin configuration, Microprocessor architecture, 8086 signals, Basic configurations, System bus timing, System Bus Structure Stacks, Interrupts and Interrupts service routines, minimum mode and maximum mode of 8086, Timing diagrams	
<b>Unit II</b>	<b>[8 Hrs]</b>
Addressing modes, Instruction set, Byte and String Manipulation, assembler directives, assembly language programming, memory interfacing, Peripheral device interfacing.	
<b>Unit III</b>	<b>[9 Hrs]</b>
8051 microcontroller: Introduction to 8051 microcontroller; Pin diagram, architecture, features & operation, Ports, memory organization, SFR's, Flags, Counters/Timers, Serial ports. Interfacing of external RAM & ROM with 8051. 8051 Interrupt structure, Interrupt vector table with priorities, enabling & disabling of interrupts	
<b>Unit IV</b>	<b>[9 Hrs]</b>
8051 microcontroller & programming: Instruction set of 8051; data transfer, logical, arithmetic & branching instructions, Addressing modes, Assembly language programming examples, Introduction to Embedded C, programming examples	
<b>Unit V</b>	<b>[10 Hrs]</b>
8051 Timers, Serial and interfacing: Counter/Timer programming in various modes. Serial communication, Operating modes, serial port control register, Baud rates. Interfacing keyboard, LED display, ADC & DAC interface, stepper motor interface, Embedded C programming examples	

**Books and References**

S.N	Title	Authors	Edition	Publisher
1.	Microprocessors and Interfacing: Programming and Hardware	Douglas V. Hall, Andrew L. Rood	1991	McGraw-Hill
2.	The 8051 Microcontroller: A Systems Approach	M.A. Mazidi, R.D. McKinlay, J.G. Mazidi,	2013	Pearson
3.	Advanced Microprocessor And Peripherals	A K Ray, K M Bhurchandi	2009	McGraw-Hill Education (India)
4.	The AVR Microcontroller and Embedded Systems: Using Assembly and C	M.A. Mazidi, S. Naimi, S. Naimi	2011	Prentice Hall

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	

**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25II301P	Microprocessors and Microcontrollers Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
<p>1. To acquire the basic knowledge of microprocessors and microcontrollers and its assembly language programming.</p> <p>2. To prepare students to perform the analysis and interfacing of various microprocessors and microcontrollers-based systems.</p>	<p>After studying this course, the students would gain enough knowledge</p> <ol style="list-style-type: none"><li>1. To explain the fundamental concepts and techniques used in microprocessors and microcontrollers</li><li>2. To implement basic programs using assembly language</li><li>3. To analyze and design various combinational and sequential circuits.</li><li>4. To develop the skills to interface, build and troubleshoot microprocessors and microcontrollers-based systems</li></ol>

Expt. No.	Title of the experiment
1	Introduction of 8086 Microprocessor and Its Trainer kit
2	Perform arithmetic operations using Assembly Language Programming in 8086 Microprocessor
3	Perform sorting of 10 numbers using Assembly Language Programming in 8086 Microprocessor
4	To find the sum of a series of 10 numbers using Assembly Language Programming in 8086 Microprocessor
5	Assembly Language Programming in 8051 Microcontroller
6	Assembly Language Programming in 8051 Microcontroller
7	Assembly Language Programming in 8051 Microcontroller
8	Embedded C Programming and interfacing in 8051 Microcontroller

**Text Books**

S.No.	Title	Authors	Edition	Publisher
1.	Microprocessors and Interfacing	D.V. Hall	---	Prentice Hall
2.	The 8051 Microcontroller: A Systems Approach	M.A. Mazidi, R.D. McKinlay, J.G. Mazidi,	---	Pearson

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	



**ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR**  
(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech. Scheme of Examination & Syllabus 2025-26**  
**INDUSTRIAL IoT**

**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25II302T	Signals and Systems	2	---	---	2	10	10	30	50

Course Objectives	Course Outcomes
<ol style="list-style-type: none"> <li>Understand the fundamental concepts of signals and systems, including their classifications, operations and represent them using graphical and mathematical tools.</li> <li>Develop proficiency in the application of Fourier Series, Fourier Transform, and Laplace Transform to analyze periodic and non-periodic signals, providing a strong foundation for studying signal behaviour in both time and frequency domains.</li> <li>Understand convolution and correlation as basic signal analysis tools for analysing continuous-time signals and systems.</li> </ol>	<ol style="list-style-type: none"> <li>Students will be able to classify, represent, and perform basic operations on various types of signals and systems.</li> <li>Students will be able to apply Fourier Series and Fourier Transform to analyze periodic and non-periodic signals in both time and frequency domains.</li> <li>Students will be able to apply Laplace Transform techniques to solve differential equations and analyze the behavior of continuous LTI systems.</li> <li>Students will be able apply convolution and correlation techniques to analyze continuous-time signals and determine the response and similarity of analog signals.</li> </ol>

**Unit I: INTRODUCTION TO SIGNALS AND SYSTEMS** **[9 Hrs]**

Representation of Signals, Elementary continuous-time Signals, Basic Operations on Signals, Classification of Signals, Classification of Systems, Introduction to signal analysis,

**Unit II: CONVOLUTION AND CORRELATION OF ANALOG SIGNALS** **[10 Hrs]**

Concept of convolution, Properties of Convolution, Convolution theorems, Correlation of functions, Relation between convolution and correlation, Application of Correlation in signal analysis

**Unit III: TRANSFORM TECHNIQUES FOR ANALOG SIGNAL ANALYSIS** **[11 Hrs]**

Fourier Series, Existence of Fourier Series, Trigonometric and exponential Fourier Series, Properties of Continuous Time Fourier Series, Introduction to Fourier Transform, Fourier Transform of Standard signals, Properties of Continuous time Fourier Transform, Introduction to Laplace Transform, Advantages and Limitations of Laplace Transform, Properties and Theorems of Laplace Transform, Solutions of Differential equations using Laplace Transform

**TEXT BOOKS**

S. No.	Title	Authors	Edition	Publisher
1	Digital Signal Processing	John G. Proakis, Dimitris G. Manolakis	III	Prentice Hall India
2	Digital Signal Processing	A. Anand Kumar	II	Prentice Hall
3	Digital Signal Processing	P. Ramesh Babu	IV	Scitech Publication

**REFERENCE BOOKS**

S. No.	Title	Authors	Edition	Publisher
1	Discrete Time Signal Processing	Alan V. Oppenheim, Ronald W. Schafer	II	Prentice Hall India
2	Fundamentals of Digital Signal Processing using MATLAB	Robert J. Schilling, Sandra L. Harris	---	Tata McGraw Hill

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	



**ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR**  
(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech. Scheme of Examination & Syllabus 2025-26**  
**INDUSTRIAL IoT**

**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25II303T	Analog and Digital Communication	2	---	---	2	10	10	30	50

Course Objectives	Course Outcomes
This course is intended to <ol style="list-style-type: none"> <li>1. Impart the basic concepts of analog modulation schemes.</li> <li>2. Describe different types of noise and predict its effect on various analog communication systems.</li> <li>3. Know the techniques of analog communication and digital communication.</li> </ol>	Student will be able to <ol style="list-style-type: none"> <li>1. Analyze basics of signals, its properties and application in communication system.</li> <li>2. Compare different modulation techniques.</li> <li>3. Evaluate the performance of pulse modulation and demodulation techniques in various transmission environments.</li> <li>4. Explain digital modulation techniques in communication systems</li> <li>5. Explain digital demodulation techniques in communication systems</li> </ol>

<b>Unit I: Analog Communication</b>	<b>[10 Hrs]</b>
Introduction, Types of communication, Need of modulation, Modulation, Modulation Index, Importance of Modulation Index, Comparison of various AM modulation technique, Angle Modulation, Noises.	
<b>Unit II: Digital Communication</b>	<b>[10 Hrs]</b>
Introduction, Binary modulation techniques, Phase shift keying, Frequency shift keying, Comparison of binary modulation techniques, Quadrature phase shift keying, Minimum shift keying, M-ary modulation techniques, M-PSK, M-QAM, M-FSK, Comparison of various M-ary Modulation Techniques	
<b>Unit III: Pulse and Data Communication</b>	<b>[10 Hrs]</b>
Introduction, Pulse Amplitude Modulation (PAM), Generation and Detection of PAM signals, PulseWidth Modulation: Generation and Detection of PWM signals, Pusle Position Modulation (PPM): Generation and Detection of PPM Signals, Pulse Code Modulation Data Communication: Introduction, Standards and Organization, Serial communication interface, Parallel communication interface, Error detection and correction techniques.	

**TEXT BOOKS**

S. No.	Title	Authors	Edition	Publisher
1	Analog and Digital Communication	Simon Haykin and Micheal Moher	2 <sup>nd</sup>	Wiley
2	Digital and Analog Communications System	Leon W. Couch	8 <sup>th</sup>	Pearson Education
3.	Introduction to Communication System	Upmanyu Madhow	1 <sup>st</sup>	Cambridge University Press

**REFERENCE BOOKS**

S. No.	Title	Authors	Edition	Publisher
1	Modern Digital and Analog Communications System	B. P. Lathi & Zhi Ding	Indian	Oxford Publication
2	Fundamentals of Digital Communication	Upmanyu Madhow	South Asian	Cambridge University Press

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	



**B. Tech. Scheme of Examination & Syllabus 2025-26**  
**INDUSTRIAL IoT**

**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25II304P	Signals, Systems and Communication Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
To apply and analyze concepts of signals, systems, and communication through practical experimentation and simulation.	<ol style="list-style-type: none"><li>1. Apply fundamental concepts of signals and systems for representation, classification, and analysis of continuous-time signals and systems.</li><li>2. Analyze analog signals using Fourier Series, Fourier Transform, and Laplace Transform techniques for signal and system analysis.</li><li>3. Evaluate convolution and correlation operations for analyzing analog signals and their engineering applications.</li></ol>

Expt. No.	Title of the experiment
1	Generation of Basic Signals
2	Basic Operations on Signals
3	Convolution and correlation of signals
4	Fourier Transform of Signals
5	Laplace Transform of Signals
6	To study the basic communication system.
7	Calculation of Modulation Index by Observing AM Wave.
8	To perform double side band AM generator transmitter and study the same.
9	To perform the DSB AM reception using AM receiver.
10	To perform PAM Generation using Sample and Hold Circuit.
11	To perform PWM Generation using Varying Sampling Frequencies.
12	To study and perform the FSK Modulation and Demodulation.
13	Study and Simulation of ASK using MATLAB.
14	Study and Simulation of BPSK Modulation & Demodulation with BER Analysis using MATLAB

**Text Books**

S.N	Title	Authors	Edition	Publisher
1.	Signals and Systems Using MATLAB	Luis F. Chaparro	---	Academic Press, Elsevier
2.	Contemporary Communication Systems Using MATLAB	John G. Proakis and Masoud Salehi		PWS Publishers

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	



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

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

## B. Tech. Scheme of Examination & Syllabus 2025-26

### INDUSTRIAL IoT

#### THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25II305T	Mechatronics	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
This course aims to provide a foundational understanding of Mechatronics by integrating mechanical, electronic, and computer engineering principles. Students will learn about various sensors and advanced sensor technologies, including smart sensors and MEMS, and analyze different actuation systems to design and implement effective Mechatronics solutions.	Student will be able to <ol style="list-style-type: none"> <li>1. Describe the evolution and role of Mechatronics in automation.</li> <li>2. Apply principles of various sensors in Mechatronics systems.</li> <li>3. Evaluate smart sensor technologies and MEMS applications.</li> <li>4. Design pneumatic, hydraulic, mechanical, and electrical actuation systems.</li> <li>5. Utilize signal conditioning, microprocessors, microcontrollers, and PLCs.</li> </ol>

<b>Unit I</b>	<b>[9 Hrs]</b>
<b>Introduction to Mechatronics:</b> Evolution of Mechatronics, origins, Multidisciplinary scenario, importance of mechatronics in automation, Mechatronics system, products and systems in manufacturing, Advanced manufacturing system, CIM, Industrial robots and automatic quality control and inspection systems.	
<b>Unit II</b>	<b>[9 Hrs]</b>
<b>Sensors:</b> Sensors/Transducers, Principles, Classification, Parameters, Static characteristics, Dynamic characteristics, Displacement sensors, Positioning sensor, Proximity sensors, velocity sensors, motion sensors, Force sensors, Accelerometer sensors, temperature sensors, Selection of sensors	
<b>Unit III</b>	<b>[9 Hrs]</b>
<b>Smart Sensors, Sensor Technologies and Applications:</b> Smart sensor basics: Introduction, mechanical-electronics transition in sensing, nature of sensors, Micro-electromechanical system (MEMS) sensors, integration of micromachining and microelectronics. <b>Micromachining techniques:</b> Bulk micromachining, surface micromachining, LIGA process.	
<b>Unit IV</b>	<b>[9 Hrs]</b>
<b>Actuators: Pneumatic &amp; Hydraulic Actuation Systems:</b> Actuation Systems, Pneumatic & Hydraulic Systems, Cylinders/Actuators, Directional Control Valves, Logic gate valves, direct & indirect control of single/double acting cylinder, development of pneumatic circuit for applications, cylinder sequencing. <b>Mechanical Actuation Systems:</b> Mechanical Systems, Types of motion, Kinematic chains, Cams, Gear Trains, Ratchet and Pawls, Belt and Chain Drives, Bearings, Mechanical Aspects of Motor Selection, <b>Electrical Actuation Systems:</b> Electrical Systems, Mechanical Switches, Solid-State Switches, Solenoid, DC Motors, AC Motors, Stepper Motors	
<b>Unit V</b>	<b>[9 Hrs]</b>
<b>Signal Conditioning, Microprocessor, Microcontrollers, and Programmable Logic Controllers</b> <b>Signal Conditioning:</b> Signal Conditioning, The Operational Amplifier, Protection, Filtering, Wheatstone Bridge, Digital Signals, Multiplexers, Data Acquisition, Digital Signal Processing, Pulse Modulation, <b>Microprocessors:</b> Control, Microprocessors Systems, Microcontrollers, Applications, <b>Programmable Logic Controllers:</b> Basic structure, I/O Processing, Data Handling, Analog Input/Output, Selection of PLC	

#### Text Books

S.N	Title	Authors	Edition	Publisher
1.	Mechatronics	W. Bolton		Pearson Education Ltd
2.	Sensors and Transducers	D. Patranabis		PHI Publication
3.	Mechatronics Integrated Mechanical Electronics Systems	K P Ramchandran, G k Vijayaraghavan, M S Balasundaram		Wiley

#### Reference Books

S.N	Title	Authors	Edition	Publisher
1	Mechatronics	HMT Ltd	Third Edition (Kindle Edition)	Tata McGraw-Hill
2	Introduction to Mechatronics	Appu Kuttan K.K		Oxford University Press

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	



**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25II305P	Mechatronics Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
To provide students with practical knowledge of selection of sensors, actuators, signal conditioning, signal processing in design and analysis of Systems for various applications.	<ol style="list-style-type: none"> <li>1. To develop a measurements system by selecting appropriate sensors to measure a physical quantity</li> <li>2. To develop pneumatic / hydraulic circuit for given application using actuators and control valves.</li> <li>3. Implementation of ladder diagram, programming using PLC to develop a new mechatronics application.</li> <li>4. Design &amp; develop a measurement system using Data Acquisition System.</li> </ol>

- **Minimum eight experiments to be performed from the list**

Expt. No.	Title of the experiment
1	Performance based on the working of Digital-to-analog conversion.
2	Performance based on the working of Analog-to-digital conversion.
3	To design & develop a measurement system using Data Acquisition System & LabVIEW software.
4	Performance based on pneumatic/hydraulic cylinder using single acting & double acting cylinder.
5	Performance based on Temperature measurement sensor
6	Performance based on distance measurement sensor.
7	Performance based on weight measurement sensor
8	Performance based on displacement measurement sensor
9	Performance based on proximity sensor (Inductive & Capacitive)
10	Performance based on water level indication sensor
11	Development of ladder diagram, programming using PLC for Lift / elevator control.
12	Development of ladder diagram, programming using PLC for electro-hydraulic system.

**Text Books**

S.N	Title	Authors	Edition	Publisher
1.	Mechatronics	W. Bolton		Pearson Education Ltd
2.	Sensors and Transducers	D. Patranabis		PHI Publication
3.	Mechatronics Integrated Mechanical Electronics Systems	K P Ramchandran, G K Vijayaraghavan, m S Balasundaram		Wiley

**Reference Books**

S.N	Title	Authors	Edition	Publisher
1	Mechatronics	HMT Ltd	Third Edition (Kindle Edition)	Tata McGraw-Hill
2	Introduction to Mechatronics	Appu kuttan K.K		Oxford University Press

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	

# ST. VINCENT PALLOTTI COLLEGE & ENGINEERING TECHNOLOGY, NAGPUR

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

## B. Tech. Scheme of Examination & Syllabus 2026-27

### ENGINEERING, SCIENCES & HUMANITIES

#### THIRD SEMESTER/ FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25II306T	Environmental Sciences	2	0		2	20	30	50

Course Objectives	Course Outcomes
<p>This course is intended</p> <ol style="list-style-type: none"> <li>1. <b>To provide knowledge</b> of natural resources, their classification, utilization, and the importance of conservation for sustainable development.</li> <li>2. <b>To create awareness</b> about climate change issues such as global warming, ozone depletion, acid rain, and their environmental impacts along with mitigation strategies.</li> <li>3. <b>To introduce</b> the fundamental concepts of <b>Sustainable Science</b> and promote awareness of eco-friendly technologies</li> </ol>	<p><b>Students will be able to</b></p> <ul style="list-style-type: none"> <li>● Describe natural resources, their classification, and the importance of conservation, including the role of individuals and public awareness in sustainable resource management.</li> <li>● Analyze climate change and assess their environmental impacts and mitigation strategies.</li> <li>● Examine different types of environmental pollution, their causes, effects, and control measures, along with solid waste management practices and disaster management techniques.</li> <li>● Apply concepts of sustainable practices to evaluate environmentally friendly materials, processes, and technologies in engineering applications</li> </ul>

#### UNIT I – Natural Resources & Climate Changes

[ 10 Hrs.]

Natural Resources- Definition, scope and importance; Need for public awareness -Institutions in environment, people in environment. Renewable and non-renewable and associated problems; Role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. **Climate Changes** Global warming and greenhouse effect, Climate change impacts and mitigation strategies.

#### UNIT II - Environmental Pollution

[ 10 Hrs.]

Definition Cause, effects and control measures of a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards. **Solid waste Management:** Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. **Disaster management:** floods, earthquake, cyclone and landslides, Ozone layer depletion, Acid rain.

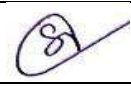
#### UNIT II – Sustainable Science

[ 10 Hrs.]

Introduction, Principles of Green Chemistry with example, Green Reagents- Super Critical Fluid (CO<sub>2</sub>)- Properties and Applications, Green Building-Introduction, Components, Reuse and safety of building material and its environmental impact., Green Crackers- Introduction, Advantages. Carbon Credit, Carbon Sequestration, Carbon Capture and Storage CCS.

#### Reference Books-

S.N	Title	Authors	Edition	Publisher
1	Environmental Problems and solutions	D.K.Asthana,Mira Asthana		S.Chand.
2	Bio-Diversity	M.S.Swaminathan		Macmillan India Ltd.
3	Essentials of Ecology & Environmental Science	Rana		Prentice Hall of India
4	Environmental Chemistry	A.K.De		New Age International
5	Environmental Pollution Monitoring & Control	Khopkar S. M.		New Age International

 Chairman - BoS	Dean – Academics	May 2026 Date of Release	1 Version	Applicable for 2026-27
---	------------------	-----------------------------	--------------	---------------------------



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

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

**B.Tech. Scheme of Examination & Syllabus 2025-26**

**CIVIL ENGINEERING**

## THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25ES402T	Fundamentals of Economics and Management	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
1. The course examines how the economics, business and industrial management practices are related and how business decision is taken.	<b>Students will be able to:</b> 1. Apply economic principles for business decisions by understanding production cost relationships 2. Assess impact of macroeconomics and government policies on business and economy. 3. Recognize key management, marketing, and financial functions and their role in effective business decision-making

<b>Unit I</b>	[10Hrs]
Economics, Classification of economics, Industrial economics, Consumer demand, Law of Demand, Determinants of demand, Demand forecasting, Law of supply, Types of Elasticity of demand, Concept of Production, Factors of Production, types of cost, cost curves.	
<b>Unit II</b>	[10Hrs]
Market Structures: Perfect competition, Monopoly, and Monopolistic competition, Functions of central bank, Inflation, Deflation, Recession, National income, GDP, GNP, Liberalization, Privatization and Globalization	
<b>Unit III</b>	[10Hrs]
Definition of management, functions of management, Functions of human resources Management, Marketing Management, Functions of Marketing Management. Methods of pricing, advertising and sales promotion. Financial Management, functions of financial management, Sources of finance.	

### Text Books

S. N	Title	Authors	Edition	Publisher
1.	Managerial Economics	D.N. Dwivedi	8th	Vikas Publishing
2.	Modern Economic Theory	K.K. Dewett	2005	S. Chand Publisher
3.	Industrial Management	Dr.I.K. Chopde, Dr.A.M. Sheikh	Revised edition	S. Chand Publisher

### Reference Books

S. N	Title	Authors	Edition	Publisher
1.	Industrial Organization and Industrial economics	T.R. Banga, S.C. Sharma	2006	Khanna Publishers

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	



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

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

## B. Tech. Scheme of Examination & Syllabus 2026-27

Branch name

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25CE341P	Career Development - I	-	-	2	1	50	-	50

Course Objectives	Course Outcomes
To develop students' quantitative aptitude, logical reasoning, verbal communication, critical thinking, self-management, and professional employability skills required for academic success, competitive examinations, and workplace readiness.	<p><b>CO1.</b> Students will be able to solve problems related to number systems, logical series, equations, ratios, proportions, and arrangement-based reasoning with accuracy and logical understanding.</p> <p><b>CO2.</b> Students will be able to apply concepts of percentage, partnership, profit and loss, discount, simple interest, and compound interest to solve practical and business-oriented numerical problems.</p> <p><b>CO3.</b> Students will be able to perform SWOC analysis, formulate SMART goals, and demonstrate professional verbal communication skills in workplace environments.</p> <p><b>CO4.</b> Students will be able to construct logical arguments, participate effectively in debates, and deliver coordinated group presentations with confidence and clarity.</p> <p><b>CO5.</b> Students will be able to demonstrate proficiency in grammar, vocabulary, reading comprehension, and professional communication while exhibiting consistent participation, individual responsibility, collaborative teamwork, and professional classroom conduct.</p>

<b>Unit I (10 marks)</b>	[7Hrs]
<b>Number System:</b> - Divisibility Test, LCM/HCF Problems, Factorization, Successive Division, <b>Number Series:-</b> Missing Number Series, Wrong Number series, Letter Series, Analogy (Number, Letter, Word, Non Verbal analogy), <b>Simple Equations :-</b> Two digit, 3 digit, ages and puzzles questions, <b>Ratio &amp; Proportion:-</b> Joining of two ratios, Proportion, Mean Proportions, Problems on ages Linear, circular Arrangement	
<b>Unit II (15 marks)</b>	[7Hrs]
<b>Percentage:</b> - Percentage to ratio conversion, Successive Percentage, Increase Decrease of Percentage, etc. Partnership Problems, <b>Profit Loss:-</b> Concept of Profit loss, Relation between CP ,SP Profit and Loss, Problems on Profit Loss. <b>Discount:-</b> Successive Discount, Relation between MP Discount and Selling Price, Problems based on Discount, Simple Interest, Compound Interest	
<b>Unit III (5 marks)</b>	[5Hrs]
SWOC Analysis and SMART Goal Setting for Personal and Professional Development <b>Corporate Communication I –</b> Professional Verbal Communication in Workplace Environments-	
<b>Unit IV (10 marks)</b>	[6Hrs]
<b>Debating Skills –</b> Logical Thinking, Argument Building, and Public Speaking <b>Group Presentation Skills –</b> Team Coordination, Public Speaking, and Presentation Techniques	
<b>Unit V (10 marks)</b>	[3Hrs]
<b>Verbal Ability Quiz –</b> Grammar, Vocabulary Building, and Reading Comprehension for Professional Communication <b>Continuous Assessment -</b> Attendance, Individual Engagement & Team Dynamics	

### Text Books

S.N	Title	Authors	Edition	Publisher
1	Quantitative Aptitude By R. S. Aggarwal	R.S. Aggarwal		
2	Quantitative Aptitude	Shripad Deo		Allied Publishers Pvt Ltd
3	A Modern Approach to Verbal & Non-Verbal Reasoning	R.S. Aggarwal		

### Reference Books

S.N	Title	Authors	Edition	Publisher
1	Quantitative Aptitude for CAT by Arun Sharma	Arun Sharma		
2	How to Develop Self-Confidence & Influence People by Public Speaking	Dale Carneige	2004	Sulabh Publications
3	Professional Communication Skills	Alok Jain	2006	S Chand & Company Ltd
4	Soft Skills & Employability Skills	Sabina Pillai	2008	Cambridge

		July 2026	NEP 3.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	