



# 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 COMPUTER SCIENCE AND ENGINEERING

### Annexure – I

### CREDIT FRAMEWORK STRUCTURE

Semester		I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course	BSC/ESC	7	7	-	-	-	-	-	-	14
Engineering Science Course		6	6	-	-	-	-	-	-	12
Program Core Course (PCC)	Program Courses	2	2	13	10	7	4	6		44
Program Elective Course (PEC)		-	-	-	-	4	6	6	4	20
Multidisciplinary Minor (MDM)	Multidisciplinary Courses	-	-	2	3	3	3	3	-	14
Open Elective (OE) Other than a particular program		-	-	-	-	2	3	3	-	08
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	-	2	1	1	2	2	-	-	08
Ability Enhancement Course (AEC -01, AEC-02)	Humanities Social Science and Management (HSSM)	1	1	-	-	2	-	-	-	04
Entrepreneurship/Economics/Management Courses		-	-	2	2	-	-	-	-	04
Indian Knowledge System (IKS)		2	-	-	-	-	-	-	-	02
Value Education Course (VEC)		-	-	2	2	-	-	-	-	04
Research Methodology	Experiential Learning Courses	-	-	-	-	-	-	-	4	04
Comm. Engg. Project (CEP)/ Field Project (FP)		-	-	-	2	-	-	-	-	02
Project		-	-	-	-	-	2	2	-	04
Internship/OJT		-	-	-	-	-	-	-	12	12
Co-curricular Courses (CC)	Liberal Learning Courses	2	2	-	-	-	-	-	-	04
<b>Total Credits (Major)</b>		<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>160</b>

		July 2026	NEP 4.0	Applicable for 2026-27 Admitted
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 COMPUTER SCIENCE AND ENGINEERING

### GROUP I: SEMESTER I

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Minimum Passing Marks	No of Hours for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1	BSC	26CE101T	Engineering Chemistry	2	-	-	2	10	10	30	50	23	1.5
2	BSC	26CE101P	Engineering Chemistry Lab	-	-	2	1	-	25	25	50	25	-
3	BSC	26CE102T	Linear Algebra and Calculus	3	-	-	3	20	20	60	100	45	3
4	BSC	26CE102P	Linear Algebra and Calculus Lab	-	-	2	1	-	25	25	50	25	-
5	ESC	26CE103T	Logic building with C	3	-	-	3	20	20	60	100	45	3
6	ESC	26CE103P	Logic building with C Lab	-	-	2	1	-	25	25	50	25	-
7	ESC	26CE104T	Concepts in Computer Engineering	2	-	-	2	10	10	30	50	23	1.5
8	PCC	26CE105T	Digital Circuits	2	-	-	2	10	10	30	50	23	1.5
9	AEC	26CE106P	Business Communication Skills – I Lab	-	-	2	1	-	25	25	50	25	-
10	IKS	26CE107T	Indian Knowledge Systems #	2	-	-	2	10	10	30	50	23	1.5
11	CC	26CE108P	Co-curricular Courses - I	-	-	4	2	-	50	-	50	25	-
<b>Total</b>				<b>14</b>		<b>12</b>	<b>20</b>	<b>80</b>	<b>230</b>	<b>340</b>	<b>650</b>		

# To be conducted online through NPTEL

		July 2026	NEP 4.0	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

### COMPUTER SCIENCE AND ENGINEERING

#### SEMESTER I

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
26CE101T	Engineering Chemistry	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
<p>This course is intended</p> <ol style="list-style-type: none"><li>To acquaint the students with the basic phenomenon, concepts, knowledge and understanding of the fundamental principles of chemistry.</li><li>To develop necessary skills and abilities to succeed in engineering education, research, Industry, environment and social context.</li></ol>	<p><b>Students will be able to</b></p> <ol style="list-style-type: none"><li>Develop innovative ideas for use of advanced materials in sustainable development.</li><li>Evaluate the role of nanotechnology in industrial applications such as energy storage, medicine, electronics, and environmental remediation.</li><li>Apply the Basic concepts of Electrochemistry in engineering</li><li>Evaluate the performance and advantages of Li-Ion battery, fuel cell and photochemical cell in terms of efficiency, working mechanism, and applications.</li><li>Apply the concept of e-waste management and analyze its environmental impact</li></ol>

#### Unit I Advanced Material

[10 Hrs]

Introduction-Need for Development, Biodegradable polymers- PLA, PCL - Synthesis, Properties and Applications, Conducting Polymer Polypyrrole, PANI Synthesis, Properties and Applications, Liquid Crystal Polymers- Types, Properties and Applications, Composite Material Constituents- Matrix & Reinforcement, Classification of composite, Advantages & Industrial Applications of Composite materials, Nanomaterials Definition, Carbon Nanotubes, Industrial Applications of Nanotechnology

#### Unit II Electrochemical Phenomenon & Battery Technology

[10 Hrs]

Introduction- brief idea about Electrochemical & Galvanic series, Electrolytic & Electrochemical Cell, Battery- Primary, Secondary & Reserve batteries- Advantages & Applications, Li Ion Battery, H<sub>2</sub>O<sub>2</sub> Fuel Cell, Photochemical Cell - Construction, Working, Advantages & Applications. Electrolysis of water to produce hydrogen

#### Unit III Chemistry of Electronic waste

[10 Hrs]

Introduction. E- Waste; composition and generation. Types of E-waste, E waste hazardous properties, Effects of pollutant (E-waste) on human health and surrounding environment, Basic principles of E waste management, Component of E waste management- Domestic e-waste disposal, E-waste Control measures- Reduction of waste at source, Segregation & Recycling, Sustainable material recovery & its applications

#### Text Books

S.N	Title	Authors	Edition	Publisher
1	Text Book of Engineering Chemistry	S.S. Dara,	New	S. Chand and Company Ltd. New Delhi.
2	Textbook of Engineering Chemistry	P.C. Jain and Monica Jain	Sixth	Dhanpat Rai and Sons, New Delhi.
3	E-waste Recycling and Management	Anish Khan, Inamuddin, Abdullah M. Ansiri	Ist	Springer

#### Reference Books

S.N	Title	Authors	Edition	Publisher
1	A Text book of Engineering Chemistry	Shashi Chawla	Ist	Dhanpat Rai & Sons, New Delhi
2	Applied Chemistry	N. Krishnamurthy:P. Vallinavagam. And K. Jeysubramanian	Ist	TMH

		July 2026	NEP 4.0	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

### COMPUTER SCIENCE AND ENGINEERING

#### SEMESTER I

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
26CE101P	Engineering Chemistry Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
<ol style="list-style-type: none"><li>To Make the students aware about various techniques available for Analysis of Material.</li><li>To Impart the skill of handling chemicals and apparatus.</li></ol>	<ol style="list-style-type: none"><li>Prepare chemical compounds, materials, and standard solutions using conventional laboratory techniques and demonstrate good laboratory practices.</li><li>Utilize electrochemical and conductometric methods for the quantitative estimation of chemical substances such as acids and metals.</li><li>Analyze industrial effluents to determine the concentration of pollutants using quantitative chemical analysis methods</li><li>Interpret water quality parameters and estimate metal concentrations through virtual simulations and demonstration-based experiments.</li></ol>

Expt. No.	Experiments based on Performance (Any SIX)
1	Synthesis urea Formaldehyde resin
2	Synthesis of Conducting polymer (Polyaniline).
3	Determination of heavy metal from industrial effluent by complexometry method.
4	Determination of heavy metal from industrial effluent by colorimeter
5	Preparation of Natural fibre reinforcement Composite material
6	Determination of strength of the given acid Conductometrically
7	Determine electrochemical equivalent of Cu metal using Faradays law
8	Preparation of different solutions (Molar, Normal & Percent solution)
	<b>Virtual Experiment - Any ONE</b>
9	Determination of Hardness from Tap water/ Well water/ Sea water
10	Determination of Alkalinity of Water Sample using Warder method
	<b>Demonstration - Any ONE</b>
11	Determination of turbidity from industrial effluent.
12	Determination of pH by using different methods.
	<b>Activity - Any ONE</b>
1	Visit to e-waste recycling plant
2	Study of Air /Water Pollution Level at different Sites in Nagpur City.
3	Study of nearby industrial chemicals and safety measures

#### Text Books

S.N	Title	Authors	Edition	Publisher
1	A Textbook on experiment and calculation in engineering chemistry	S.S. Dara	9th	S.Chand

#### Reference Books

S.N	Title	Authors	Edition	Publisher
1	Applied Chemistry theory and practical	O.P. Virmani and A.K. Narular	1st	New Age International
2	Laboratory Manual on Engineering Chemistry	Dr. Subdharani	1st	Dhanpat Rai Publishing

		July 2026	NEP 4.0	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 & Proposed Syllabus 2026-27

### COMPUTER SCIENCE AND ENGINEERING

#### FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
26CE102T	Linear Algebra and Calculus	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
<p><b>This course is intended to</b></p> <ol style="list-style-type: none"> <li>Develop students' conceptual understanding and computational skills in Matrix Algebra and Differential Equations for solving mathematical problems.</li> <li>Enable learners to apply Multivariate and Vector Calculus for analyzing functions of several variables and modeling physical phenomena.</li> </ol>	<p><b>Students will be able to</b></p> <ol style="list-style-type: none"> <li>Apply matrix concepts to solve and analyze linear systems.</li> <li>Analyze and solve engineering problems involving eigenvalues, eigenvectors, and functions of matrices.</li> <li>Solve multivariate calculus problems involving partial derivatives, Jacobians, and optimization.</li> <li>Apply first order and higher order differential equations to solve problems in engineering.</li> <li>Evaluate vector calculus operations and their physical applications.</li> </ol>
<b>Unit I</b>	<b>[9Hrs]</b>
<b>Matrix Algebra:</b> Introduction to matrices, Rank of a matrix, Consistency of system of linear equations, Linear and orthogonal transformations, Linear dependence of vectors.	
<b>Unit II</b>	<b>[9Hrs]</b>
<b>Matrices:</b> Characteristics equation, Cayley- Hamilton Theorem, Eigen values and Eigen vectors, Reduction to diagonal form, Reduction of quadratic form to canonical form by orthogonal transformation, Sylvester's theorem.	
<b>Unit III</b>	<b>[9Hrs]</b>
<b>Multivariate Calculus:</b> Functions of several variables and their partial derivatives, Chain rule and total differential coefficient, Jacobians and its properties, Maxima –Minima of functions of two variables, Lagrange's method of undetermined multipliers.	
<b>Unit IV</b>	<b>[9Hrs]</b>
<b>Differential Equations:</b> First order and first degree differential equations: Linear, Higher order differential equations with constant coefficients, Method of variation of parameters, Cauchy's homogeneous linear equation, Applications of differential equations.	
<b>Unit V</b>	<b>[9Hrs]</b>
<b>Vector Calculus:</b> Vector differentiation, Gradient, Directional derivatives, Divergence and Curl with their physical interpretation Solenoidal and Irrotational motions, Scalar potential, Line integral & Work done.	

#### Text Books

S.N	Title	Authors	Edition	Publisher
1	Higher Engineering Mathematics	B. S. Grewal	38th	Khanna Publishers, New Delhi.
2	Higher Engineering Mathematics	H. K. Das & Er. Rajnish Verma	1st	S. Chand & CO. Pvt. Ltd., New Delhi

#### Reference Books

S.N	Title	Authors	Edition	Publisher
1	Higher Engineering Mathematics	B.V. Ramana,	11th reprint, 2010.	Tata McGraw Hill New Delhi
2	A Text Book of Engineering Mathematics	Peter O' Neil	8 <sup>th</sup>	Thomson Asia Pvt. Ltd., Singapore.

			July 2026	NEP 4.0	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

### COMPUTER SCIENCE AND ENGINEERING

#### FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
26CE102P	Linear Algebra and Calculus Lab	--	--	2	1	25	25	50

Course Objectives	Course Outcomes
<p><b>This Course is intended to:</b></p> <ol style="list-style-type: none"><li>To develop students' computational proficiency in solving problems related to linear algebra, calculus, and differential equations using SageMath with an emphasis on symbolic computation and numerical methods.</li><li>To enable students to apply SageMath for solving and visualizing problems in vector calculus through effective use of graphical and analytical tools.</li></ol>	<p><b>Students will be able to:</b></p> <ol style="list-style-type: none"><li>Apply fundamental matrix operations and solve systems of linear equations using Sage Math.</li><li>Apply concepts of linear algebra to compute eigenvalues and eigenvectors of matrices using SageMath.</li><li>Evaluate partial derivatives of multivariable functions and solve first and higher-order ordinary differential equations using SageMath.</li><li>Analyze and visualize vector calculus operations including gradient, divergence, curl, and evaluate line and surface integrals using SageMath.</li></ol>

#### List of Experiments:-

Experiment No.	List of Experiment
1	To Implement basic matrix operations using SageMath's symbolic computation tools.
2	To check the consistency of a system of linear equations using augmented matrices and SageMath.
3	To solve systems of linear equations using various within the SageMath environment.
4	To determine eigenvalues and eigenvectors of matrices using built-in SageMath functions.
5	To implement and validate the Cayley-Hamilton Theorem with the aid of SageMath.
6	To compute partial derivatives of various orders for multivariable functions using SageMath.
7	To solve first-order and higher-order differential using SageMath's differential equation solvers.
8	To find maxima and minima of functions of two variables using partial derivatives and the second derivative test implemented in SageMath.
9	To compute and visualize vector differential operations using SageMath.
10	To compute vector integrals in SageMath.

#### Text Books

S.N	Title	Authors	Edition	Publisher
1	Computational Mathematics with SageMath	Paul Zimmermann	1st	SIAM Publications Library.
2	Basics of SageMath : Mathematics(Practicals)	Varun Kumar	1st	Amazon KDP

#### Reference Books

S.N	Title	Authors	Edition	Publisher
1	Mathematics-SageMath Software System	Indrajeet Varhadpande & Dr. Kirti Sahu	1 <sup>st</sup>	Himalaya Publication
2	Applied Mathematics Using SageMath	Dr. Kirti Sahu & Dr. Sajid Anwar	1 <sup>st</sup>	Himalaya Publication

		July 2026	NEP 4.0	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

### COMPUTER SCIENCE AND ENGINEERING

#### FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
26CE103T	Logic Building with C	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
<p><b>This course is intended to provide</b></p> <ol style="list-style-type: none"> <li>To make the student learn a programming language.</li> <li>To learn problem solving techniques.</li> <li>To teach the student to write programs in C and to solve the problems.</li> </ol>	<p><b>Students will be able to:</b></p> <ol style="list-style-type: none"> <li>Explain basic C programming constructs for problem solving.</li> <li>Apply decision-making and looping concepts to develop C programs for problem solving.</li> <li>Develop modular C programs using functions, recursion, and pointers.</li> <li>Experiment with arrays, strings, searching, and matrix operations for problem solving.</li> <li>Develop data management applications using structures and file handling techniques.</li> </ol>

<b>Unit I</b>	<b>[8Hrs]</b>
<p><b>Introduction</b> : Programming Languages, Translators, History and features of C language, structure of a C program, tokens, keywords, identifiers, constants, variables, data types, operators, arithmetic expressions, precedence and associativity of operators flowcharts, algorithms, Types of programming errors (syntax, runtime, logical errors) Introduction to AI-assisted programming tools and responsible use of Generative AI for coding support.</p>	
<b>Unit II</b>	<b>[10Hrs]</b>
<p><b>Decision Making Control Structures</b> : if, if-else, nested if statements, Conditional operators (? :), Switch Case Statements <b>Loop Control Structures in C</b> : Conditional control structures : for , while , do- while , Unconditional control structures: break, continue, goto statement and its limitations.</p>	
<b>Unit III</b>	<b>[10Hrs]</b>
<p><b>Functions and Pointers</b> : Introduction to functions, why use function, Scope rule of function, implementation of functions, Recursion: As a different way of solving problems. Pointers declaration &amp; its use, Types of Pointers, Call by Value, Call by Reference</p>	
<b>Unit IV</b>	<b>[9Hrs]</b>
<p><b>One-Dimension and Two-Dimension arrays</b>: creation of array, declaration, initialization and displaying the elements, memory representation, traversal, insertion, deletion, linear search and binary search. Read &amp; display the matrix on the screen, matrix manipulation operations like addition, multiplication. String handling basics using character arrays and standard string operations</p>	
<b>Unit V</b>	<b>[8Hrs]</b>
<p><b>Structures &amp; File Handling in C</b> : Introduction to structures , declaration , initialization and accessing structure members , nested structures ,File operations-File Opening, Closing File, read content of file, Structured file handling using records and user-defined data types. Introduction to file error handling, validation techniques, and debugging of file operations.</p>	

#### Text Books

S.N	Title	Authors	Edition	Publisher
1	Programming With C	Byron S.Gottfried	Second Edition	Schaum Series
2	How to solve it by Computer	R.G. Dromey	First Edition	Pearson Education
3	Programming in ANSI C	E. Balguruswamy	Second Edition	Tata Mc-Graw Hill

#### Reference Books

S.N	Title	Authors	Edition	Publisher
1	The Complete Reference C	Herbert Schildt	Fourth Edition	Tata Mc-Graw Hill
2	The 'C' Programming Language	Kernighan and Ritchie	First Edition	Prentice Hall

		July 2026	NEP 4.0	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

### COMPUTER SCIENCE AND ENGINEERING

#### FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
26CE103P	Logic Building with C Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
<p><b>This course is intended to :</b></p> <ol style="list-style-type: none"><li>1. To make the student learn a programming language</li><li>2. To learn problem solving techniques.</li><li>3. To teach the student to write programs in C and to solve the problems.</li></ol>	<p><b>Students will be able to :</b></p> <ol style="list-style-type: none"><li>1. Apply fundamental concepts of C programming for computational problem solving.</li><li>2. Develop modular C programs using functions, recursion, and pointers for problem solving.</li><li>3. Utilize arrays, strings, and matrix operations for data processing applications.</li><li>4. Build applications using structures and file handling for data management</li></ol>

Expt. No.	Title of the experiment
1	To implement programs for basic arithmetic and decision-making problems and implement them in C.
2	To implement relational, logical and bitwise operators using menu-driven applications.
3	To implement decision making statements using if-else, nested if and switch-case statements for real-world applications
4	To implement loop control structures for solving problems.
5	To implement modular programs using user-defined functions, recursion, call by value and call by reference techniques.
6	To implement one-dimensional and two-dimensional arrays for searching, sorting and matrix operations.
7	To implement string handling operations without using built-in library functions and develop simple text processing applications.
8	To implement applications using structures, nested structures and arrays of structures.
9	To implement file handling operations such as file creation, reading, writing, copying and CSV file processing using C.
10	To implement Linux environment and implement execution of C programs using GCC compiler and terminal commands.
11	Micro Project based on above curriculum

#### Text Books

S.N	Title	Authors	Edition	Publisher
1	Programming With C	Byron S.Gottfried	Second Edition	Schaum Series
2	How to solve it by Computer	R.G. Dromey	First Edition	Pearson Education
3	Programming in ANSI C	E. Balguruswamy	Second Edition	Tata Mc-Graw Hill

		July 2026	NEP 4.0	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**  
**COMPUTER SCIENCE AND ENGINEERING**

**FIRST SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
26CE104T	Concepts in Computer Engineering-I	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
<b>This course is intended</b> 1. To remember the basics of Computer and Computer history. 2. To understand the utility of programming languages. 3. To learn basics of computer software and Operating Systems.	<b>Students will be able to</b> 1. Compare the fundamentals of computer systems and emerging computing technologies. 2. Apply problem-solving techniques using algorithms, flowcharts, pseudocode, and programming language concepts for computational tasks. 3. Demonstrate software and operating system concepts for computing applications.

<b>Unit I</b>	<b>[10 Hrs]</b>
---------------	-----------------

**Computer organization and memory systems:**  
 Description of computer, input and output unit, Memory cell, Memory organization, Primary memory, Secondary Memory, Serial access memory, Magnetic hard disk.  
 Overview of computer generations, Moore's Law, Classification of computers.  
 Emerging Trends in Computing: Introduction to Artificial Intelligence (AI) and Machine Learning (ML), Basics of Internet of Things (IoT), Cloud Computing and Green Computing.

<b>Unit II</b>	<b>[10 Hrs]</b>
----------------	-----------------

**Computer languages:**  
 Algorithms, Idea of Algorithm: Steps to solve logical and numerical problems. Representation of Algorithm: Flowchart and Pseudo code with examples, Need of programming languages, Characteristics of good programming languages, Machine level language, Assembly language, Middle level language – C, High level programming languages, Factors affecting the choice of the languages, Language Translators - Compiler, Interpreter and Assembler.

<b>Unit III</b>	<b>[10 Hrs]</b>
-----------------	-----------------

**Computer softwares and operating systems:**  
 Introduction to computer software, Types of computer software, System management programs, System development programs, Unique application programs, Problem solving, Structuring the logic, Developing a program, Debugging concept.  
 Need and functions of Operating System, Types of operating system, Introduction to operating systems – UNIX, MAC OS, LINUX (Ubuntu, Fedora) and WINDOWS, Open-source software.

**Text Books**

S.N	Title	Authors	Edition	Publisher
1	Fundamentals of Computers	V. Rajaraman	5th	PHI
2	Fundamentals of Computers	Balguruswamy	1st	McGraw Hill Education

**Reference Books**

S.N	Title	Authors	Edition	Publisher
1	Operating Systems	Achyut Godbole & Atul Kahate	3rd	McGraw Hill Education
2	Open Source Technology	Kailash Vadera & Bhavesh Gandhi	1st	Laxmi Publications

		<b>July 2026</b>	<b>NEP 4.0</b>	<b>Applicable for 2026-27</b>
<b>Chairman - BoS</b>	<b>Dean – Academics</b>	<b>Date of Release</b>	<b>Version</b>	



**FIRST SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
26CE105T	Digital Circuits	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
<b>This course is intended to</b> <ol style="list-style-type: none"><li>Understanding the basics of Number system and Boolean functions</li><li>Design and analysis of digital circuits.</li><li>Foundation for advanced digital system subjects.</li></ol>	<b>Students will be able to</b> <ol style="list-style-type: none"><li>Explain number systems, logic gates, Boolean algebra and Karnaugh Maps.</li><li>Design and analyze combinational circuits such as adders, multiplexers, decoders, and encoders</li><li>Analyze sequential circuits using flip-flops, registers, and counters.</li></ol>

<b>Unit I</b>	<b>[10 hrs]</b>
<b>Number Systems &amp; Code Conversion:</b> Number Systems & Code conversion, Boolean Algebra & Logic Gates, Truth Tables, Universal Gates, Simplification of Boolean functions, SOP and POS methods – Simplification of Boolean functions using K- maps (up to 5 Variable K-map), Introduction to HDL Concepts	
<b>Unit II</b>	<b>[10 hrs]</b>
<b>Combinational Circuits:</b> Adders & Subtractors, BCD Adder & Subtractor, Comparator Circuits, Carry Look ahead adder, Multiplexers, De-multiplexers, Encoders and Priority Encoders, Decoders and Display Drivers	
<b>Unit III</b>	<b>[10 hrs]</b>
<b>Sequential Circuits:</b> Latches, Flip Flop: SR, D, JK, T, Master Slave, Flip-Flop Conversions, Shift Registers: SISO, SIPO, PISO, and PIPO, Counters: Synchronous, Asynchronous(Ripple), Ring Counters & Johnson Counters	

**Text Books**

S. N.	Title	Authors	Edition	Publisher
1	Digital Design	M. Morris Mano, Michael D. Ciletti	5 <sup>th</sup> Edition	Pearson Education
2	Digital Electronics: Principles, Devices and Applications	Anil K. Maini	4 <sup>th</sup> Edition	John Wiley & Sons, Ltd

**Reference Books**

S. N.	Title	Authors	Edition	Publisher
1	Modern Digital Electronics	Jain R.P	4 <sup>th</sup> Edition	TMGH
2	Digital Fundamentals – A Systems Approach	Thomas L. Floyd	11 <sup>th</sup> Edition	Pearson

		<b>JULY 2026</b>	<b>NEP 4.0</b>	<b>Applicable for 2026-27</b>
<b>Chairman - BoS</b>	<b>Dean – Academics</b>	<b>Date of Release</b>	<b>Version</b>	





**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**

**COMPUTER SCIENCE AND ENGINEERING**

		JULY 2026	NEP 4.0	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

### COMPUTER SCIENCE AND ENGINEERING

#### FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
26CE106P	Business Communication Skills – I Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
To develop students' ability to apply, analyze, and evaluate LSRW skills in business and professional communication settings.	<b>Students will be able to:</b> 1. Apply effective pronunciation, grammar, and voice modulation in professional communication. 2. Analyze spoken and written texts using listening and reading comprehension skills for professional and competitive contexts. 3. Create clear and professional business correspondence using appropriate format, tone, and language. 4. Evaluate communication strategies to demonstrate confidence and clarity in structured presentations and group discussions.

Expt. No.	Title of the experiment
1	Pronunciation and Voice Modulation
2	Self-Introduction
3	Grammar
4	Business Correspondence
5	Reading Comprehension for Competitive Exam
6	Listening Skills (Speeches of great Personalities)
7	Presentation Skills
8	Group Discussion

#### Reference Books:

S. N	Title	Authors	Edition	Publisher
1	Communication Skills for Engineers	C. Muralikrishna & Sunita Mishra	2nd Edition, 2011	Pearson India Education Services
2	Communication Skills	Dr. L. Bisen, Dr. B. Agrawal & Dr. N. T. Kalyani	1st Edition, 2021	Himalaya Publishing House
3	Barron's IELTS Superpack	Lin Lougheed	2012	Barrons Educational Series

		July 2026	NEP 4.0	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	