Annexure – I

CREDIT FRAMEWORK STRUCTURE

Semester	I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course (BSC)	7	7	-	-	-	-	-	-	14
Engineering Science Course (ESC)	4	6	-	-	-	-	-	-	10
Program Core Course (PCC)	5	3	15	10	11	9	9	-	74
Program Elective Course (PEC)	-	-	-	-	3	3	3	3	
Multidisciplinary Minor (MDM)	-	-	2	3	3	3	3	-	14
Open Elective (OE)	-	-	-	-	-	2	3	3	08
Vocations Skill Courses (VSC)	-	-	-	2	2	-	-	-	04
Ability Enhancement Course (AEC)	1	1	3	-	-	-	-	-	05
Indian Knowledge System (IKS)	-	2	-	-	-	-	-	- -	02
Value Education Course (VEC)	-	-	-	3	-	-		-	03
Skill Enhancement Courses (SEC)	3	1	1	1	1	1	-	-	08
Co-curricular Courses (CC)	2	2	-	-	-	-	--	--	04
Project work, seminar and internship in industry (ELC)	-	-	1	1	-	2	2	12	18
Research Methodology	-	-	-	-	-	-	-	2	02
Total Credits (Major)	22	22	22	20	20	20	20	20	166

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

CIVIL ENGINEERING

FIFTH SEMESTER

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.	PCC	**24CV501T**	Geotechnical Engineering	**3**	**-**	**-**	**3**	**20**	**20**	**60**	**100**	**45**	**3**
2.	PCC	**24CV501P**	Geotechnical Engineering Lab	**-**	**-**	**2**	**1**	**-**	**25**	**25**	**50**	**25**	**-**
3.	PCC	**24CV502T**	Transportation Engineering	**2**	**-**	**-**	**2**	**10**	**10**	**30**	**50**	**23**	**1.5**
4.	PCC	**24CV502P**	Transportation Engineering Lab	**-**	**-**	**2**	**1**	**-**	**25**	**25**	**50**	**25**	**-**
5.	PCC	**24CV503T**	Reinforced Cement Concrete Structures	**3**	**-**	**-**	**3**	**20**	**20**	**60**	**100**	**45**	**3**
6.	PCC	**24CV503P**	Reinforced Cement Concrete Structures Lab	**-**	**-**	**2**	**1**	**-**	**25**	**25**	**50**	**25**	**-**
7.	PEC	**24CV504T**	Program Elective – I (Refer PE Basket)	**3**	**-**	**-**	**3**	**20**	**20**	**60**	**100**	**45**	**3**
8.	VSC	**24CV505T**	Technical Skill Development - II	**2**	**-**	**-**	**2**	**-**	**50**	**-**	**50**	**-**	**-**
9.	SEC	**24CV541P**	Career Development - V	**-**	**-**	**2**	**1**	**-**	**50**	**-**	**50**	**-**	**-**
10.	MDM	**24CV531M**	MDM - III (Refer MDM Basket)	**3**	**-**	**-**	**3**	**20**	**20**	**60**	**100**	**45**	**3**
Total				**16**	**0**	**8**	**20**	**90**	**265**	**345**	**700**	**-**	**-**

Program Elective - I	
24CV504T(i)	Advanced Structural Analysis
24CV504T(ii)	Advanced Surveying
24CV504T(iii)	Advanced Fluid Mechanics

Multidisciplinary Minor - V	
24CV531M	Building Planning and Construction

		July 2026	**NEP 2.1**	**Applicable for 2026-27**
Chairman - BoS	**Dean – Academics**	**Date of Release**	**Version**	

Basket for Multi-Disciplinary Minor Courses (MDM)

A. Civil Engineering

Semester	Course Category	Course Code	Name of Course
III	MDM-I	24CV331M	Basics of Civil Engineering
IV	MDM-II	24CV431M	Basic Construction Materials
V	MDM-III	24CV531M	Building Planning & Construction
VI	MDM-IV	24CV631M	Building Services
VII	MDM-V	24CV731M	Smart Transit System

Basket for Program Elective Courses (PEC)

B. Civil Engineering

Semester	Course Category	Course Code	Name of Course
VI	PEC	24CV504T(i) 24CV504T(ii) 24CV504T(iii)	Advanced Structural Analysis Advanced Surveying Advanced Fluid Mechanics
VI	PEC	24CV604T(i) 24CV604T(ii) 24CV604T(iii) 24CV604T(iv)	Advanced Reinforced Cement Concrete Structures Air Pollution & Control Foundation Engineering Advanced Traffic Engineering
VII	PEC	24CV704T(i) 24CV704T(ii) 24CV704T(iii) 24CV704T(iv)	Advanced Steel Design Mass Rapid Transit System Ground Improvement Techniques Disaster Management
VIII	PEC	24CV802T(i) 24CV802T(ii) 24CV802T(iii)	Industrial Wastewater Treatment Retrofitting and Rehabilitation of Civil Infrastructure Modern Construction Materials

Basket for Open Elective Courses (OE)

C. Civil Engineering

Semester	Course Category	Course Code	Name of Course
VI	VI	24CV661O	Public Health Engineering
VII	VII	24CV761O	Green Buildings
VIII	VIII	24CV861O	Air Pollution and Control

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CV501T	Geotechnical Engineering	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. To acquire knowledge for classifying the soil based on index and engineering properties. 2. To recognize the concepts of compaction, flow through soil, stress distribution, consolidation and shear strength of soils.	At the end of the course, the student will be able to 1. Identify various types of soils and their properties. 2. Explain the flow through soil and its effect for engineering solution. 3. Analyze the stress distribution of soil under various loading conditions and Apply the principles of soil mechanics in order to find Compaction Characteristics. 4. Estimate magnitude and rate of settlement of soil. 5. Evaluate the shear strength of soil.

Unit I	**[10 Hrs]**
Introduction: Formation of soil, Three Phase diagram and functional relationship, Soil structure, Index properties.	
Unit II	**[8 Hrs]**
Permeability & Seepage: **Permeability:** Darcy's law, Factors affecting permeability, Laboratory determination of coefficient of permeability, Permeability of layered systems. **Seepage:** Total, neutral and effective stresses, Capillarity, Characteristics of Flow nets.	
Unit III	**[9 Hrs]**
Stress Distribution & Compaction: **Stress Distribution:** Boussinesq's and Westergaard's theories (Vertical & Tangential Stresses): point loads & uniformly distributed loads, Newmark's influence chart. **Compaction:** Mechanism of compaction, factors affecting compaction, Laboratory Compaction Tests, field compaction equipment.	
Unit IV	**[9 Hrs]**
Consolidation: Compression of laterally confined soil, Terzaghi's 1-D consolidation theory, Determination of coefficient of consolidation, Degree of consolidation. Determination of pre-consolidation pressure, Settlement, Rate of settlement	
Unit V	**[9 Hrs]**
Shear Strength of Soils: Importance of shear strength, Shear Parameters, Mohr's circle, Mohr Coulomb's Failure theories, Laboratory tests for determination of shear strength – Direct shear test, Tri-axial compression test (UU, CU and CD), Unconfined compression tests, Vane shear test. Sensitivity & thixotropy of clay.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Soil Mechanics & Foundations	B. C. Punmia	18th	Laxmi Publications
2	Geotechnical Engineering	Debashis Moitra	-	Universities Press
3	Soil Mechanics & Foundation Engineering	K. R. Arora	-	Standard publication

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Principles of Geotechnical Engineering	Braja M Das	2nd	Cengage Publications
2	Soil Mechanics and Foundation Engineering	V.N.S. Murty	Reprint 2022	CBS Publishers & Distributers

		July 2026	NEP 2.1	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CV501P	Geotechnical Engineering Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
To provide hands-on experience in performing standardized laboratory and field tests to determine the index and engineering properties of soil according to relevant Indian Standard	At the end of the course, the student will be able to 1. Demonstrate tests related to index properties of soils. 2. Demonstrate tests related to engineering properties of soils.

Minimum EIGHT experiments to be performed from the list as below

Expt. No.	Title of the experiment
1	Determination of water content of given soil sample by oven drying method as per IS 2720 (Part- 13).
2	Determination of specific gravity of soil by pycnometer method as per IS 2720 (Part- 3).
3	Determination of grain size distribution of given soil sample by mechanical sieve analysis as per IS 2720 (Part- 4).
4	Determination of Plastic Limit & Liquid Limit along with Plasticity Index of given soil sample as per IS 2720 (Part- 5).
5	Determination of Shrinkage Limit of given soil sample as per IS 2720 (Part- 6).
6	Determination of co-efficient of permeability of soil by constant head test / falling head test as per IS 2720 (Part- 17)
7	Determination of Maximum Dry Density (MDD) and Optimum Moisture Content (OMC) by standard proctor test of given soil sample as per IS 2720 (Part- 7).
8	Determination of field density and dry unit weight of soil in field by core cutter method as per IS 2720 (Part- 29).
9	Determination of field density and dry unit weight of soil in field by sand replacement method as per IS 2720 (Part- 28)
10	Determination of shear strength of soil by direct shear test as per IS 2720 (Part-13)
11	Determination of Unconfined compression test of given soil sample as per IS 2720 (Part-10)
12	Demonstration of Triaxial Compression Test as per IS 2720 (Part-11)

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CV502T	Transportation Engineering	2	-	-	2	20	20	30	50

Course Objectives	Course Outcomes
1. To know about Highway, its classification and modern methods of transportation engineering. 2. To understand the design of Highways based on traffic and geometrics. 3. To learn about materials required for construction of Highways.	1. Classify and plan of the highways and introduce to Intelligent Transportation System. 2. Design the highway based on volume and speed data and Traffic Safety Audit. 3. Design the highway based on geometric features.

Unit I	**[10 Hrs]**
Highway Development & Planning: Principles of Highway planning, Road development in India Classification of roads. Highway Alignment: Requirements, Engineering Surveys. Current road projects in India; project preparation. Use of intelligent transportation system. Introduction to BRTS, Metro and other modern methods of transportation.	
Unit II	**[10 Hrs]**
Traffic Studies: Volume studies, speed studies, parking studies and accident studies. **Traffic Safety** : Causes and types of accidents, Urban traffic management, highway lighting, Traffic safety audit	
Unit III	**[10 Hrs]**
Highway Geometric Design: Cross Section elements, carriageways, camber, stopping & overtaking sight distances, Horizontal alignment- Curves, design of super elevation, widening, transition curves, vertical curves.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Highway Engineering	S.K.Khanna, .E.G.Justo		Nem Chand & Bros
2	Principles and Practice of Highway Engineering	L.R.Kadiyali		Khanna Publishers

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Principles of Transportation and Highway Engineering	RaoG.V.		Tata McGraw Hill

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CV502P	Transportation Engineering Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
To evaluate the physical properties of highway materials including subgrade soil, aggregates, and bitumen, and to analyze traffic characteristics through field studies to ensure standardized pavement design and safety.	**After completion of this course, students will be able to:** **1.** Perform the laboratory tests on natural and treated subgrade. **2.** Perform the laboratory tests on materials used for grade course. **3.** Perform the laboratory tests on materials used for surface and wearing course. **4.** Study the traffic volume, spot speed and prepare report.

Minimum TEN experiments to be performed from the list as below

Expt. No.	Title of the experiment
1	Determination of strength of subgrade by CBR test.
2	Determination of strength of treated subgrade by CBR test.
3	Classification of subgrade soil using AASHTO classification.
4	Determination of Aggregate Crushing Value.
5	Determination of Aggregate Impact Value.
6	Determination of Aggregate Abrasion value by Los Angeles Abrasion Testing method.
7	Determination of flakiness index and elongation index of aggregates.
8	Determination of water absorption value of the aggregates.
9	Determination of Bitumen Penetration Value by penetrometer.
10	Determination of Bitumen Ductility Value.
11	Determination of Softening Point of Bitumen.
12	Determination of Flash and Fire point of Bitumen.
13	Traffic Volume Study and prepare a report of analysis by representing the data in various formats.
14	Spot Speed Study and determination of various speed limits for a given section of road.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Highway Engineering	S.K.Khanna, .E.G.Justo		Nem Chand & Bros
2	Principles and Practice of Highway Engineering	L.R.Kadiyali		Khanna Publishers
3	Relevant IS Codes	Rangwala S. C.		Charotar Publications

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CV503T	Reinforced Cement Concrete Structures	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. To understand and apply working stress and limit state design philosophies. 2. To design reinforced concrete beams, columns, slabs and footings.	At the end of the course, students will be able to 1. Understand the concept of working stress method for beams. 2. Analyse and design of reinforced concrete beam with limit state approach. 3. Design one way and two way slab. 4. Design short and slender columns. 5. Design isolated footings and staircase.

Unit I: Design of Beam (Working Stress Method)	**[9Hrs]**
Introduction, Assumptions, Basic concepts, design constants. Analysis and design of rectangular section. Balanced, under-reinforced and over-reinforced sections; Limitations of Working stress methods.	
Unit II: Design of Beam (Limit State Method)	**[9Hrs]**
Introduction to Limit state method, basic assumptions, design of reinforced rectangular, T and L shaped beams in flexure, shear and torsion.	
Unit III : Design of Slab (Limit State Method)	**[9Hrs]**
Design of one-way, two-way, cantilever and continuous slab.	
Unit IV: Design of Column (Limit State Method)	**[9Hrs]**
Design of short and slender columns for axial load and with uni-axial bending.	
Unit V : Design of Footing and Staircase	**[9Hrs]**
Types of footings; Design of isolated footing. Design of Staircase.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Design of Reinforced Concrete Structures	P. Dayaratnam		Oxford & IBH Pub., New.Delhi.
2	Reinforced Concrete-Limit State Design	A.K.Jain		Nem Chand & Bros., Roorkee
3	Reinforced Concrete Design	S.N.Sinha		TMH Pub.,N.Delhi
4	RCC Design	B.C Punamia and Ashok Kumar Jain		Laxmi Publications
5	Reinforced concrete	H J Shah	Vol. I & II	Charotar Publishing House Pvt. Ltd
6	Design of Reinforced Concrete Structure	N Subramanian		Oxford

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Reinforced Concrete	I.C.Syal & A,K,Goel		A.H,Wheeler &Co.Delhi
2	IS 456:2000, Plain and Reinforced concrete - code of practice.	BIS		BIS
3	SP 16 (1980): Design Aids for Reinforced Concrete to IS 456:1978	BIS		BIS

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CV503P	Reinforced Cement Concrete Structures Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
To provide students with practical experience in understanding and applying the principles of reinforced concrete (RCC) design and construction, including analyzing stress and strain in structural elements, designing and detailing RC structures, and understanding code requirements.	At the end of course, students will be able to 1. Design and reinforcement detailing of structural components. 2. Apply integrated approach for structural design of building 3. Program in Excel for design of structural elements

Expt. No.	Title of the experiment
1	Analysis of rectangular Beam section by working stress method.
2	Analysis of rectangular Beam section by Limit State method.
3	Design and draw reinforcement detailing of Rectangular / T Beam / L Beam Section.
4	Design and draw reinforcement detailing of Short / slender Column.
5	Design and draw reinforcement detailing of One way / Two Way slab.
6	Design and draw reinforcement detailing of Cantilever slab.
7	Design and draw reinforcement detailing of isolated / combined footing.
8	Design and draw reinforcement detailing of staircase.
9	One Field Visit and Report writing.
10	Excel Programming for any of the design mentioned above.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Design of Reinforced Concrete Structures	P. Dayaratnam	-	Oxford & IBH Pub., New.Delhi.
2	Reinforced Concrete-Limit State Design	A.K.Jain	-	Nem Chand & Bros., Roorkee
3	Reinforced Concrete Design	S.N.Sinha	-	TMH Pub.,N.Delhi
4	RCC Design	B.C Punamia and Ashok Kumar Jain	-	Laxmi Publications
5	Reinforced concrete	H J Shah	Vol. I & II	Charotar Publishing House Pvt. Ltd
6	Design of Reinforced Concrete Structure	N Subramanian	-	Oxford

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Reinforced Concrete	I.C.Syal & A,K,Goel	-	A.H,Wheeler &Co.Delhi
2	IS 456:2000, Plain and Reinforced concrete - code of practice.	BIS	-	BIS
3	SP 16 (1980): Design Aids for Reinforced Concrete to IS 456:1978	BIS	-	BIS

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits		Evaluation		
22CV503T(i)	PE – I Advanced Structural Analysis	3	-	-	3	MSE	CA	ESE	Total
						20	20	60	100

Course Objectives	Course Outcomes
1. To introduce the stiffness method of analysis. 2. To analyse rigid jointed beams and frames using stiffness matrix method. 3. To analyse pin jointed frames using matrix stiffness method. 4. To analyse grid using matrix stiffness method.	At the end of the course, the students will be able to- 1. Understand basic concepts of stiffness method. 2. Analyse rigid jointed beams using matrix stiffness method. 3. Analyse rigid jointed frames using matrix stiffness method. 4. Analyse pin jointed frames using matrix stiffness method. 5. Analyse grid using matrix stiffness method.

Unit I	**[8 Hrs]**
Introduction to Stiffness Concept: Degree of Kinematic Indeterminacy for rigid jointed structures and pin jointed structures. Introduction to stiffness concept. Direct Stiffness Method.	
Unit II	**[8 Hrs]**
BEAM Element: Concept of equilibrium equation. Analysis of continuous beam using BEAM element stiffness method. Maximum redundancy = 3	
Unit III	**[8 Hrs]**
TRUSS (BAR) Element: Analysis of pin jointed frames using TRUSS element stiffness method. Maximum redundancy =	
Unit IV	**[8 Hrs]**
FRAME Element: Concept of rotation transformation matrix. Analysis of portal frames using FRAME element stiffness method. Analysis of frame with inclined leg using FRAME element stiffness method. Maximum redundancy = 3	
Unit V	**[8 Hrs]**
GRID element: Introduction to GRID element. Analysis of grid using GRID element stiffness method. Maximum number of unknowns = 3	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Matrix Structural Analysis	Hibbeler R. C.	-	Pearson Publications
2	Structural Analysis: A Matrix Approach, SI Edition	Aslam Kassimalli	-	Prentice Hall
3	Matrix analysis of structures	Pandit and Gupta.	-	TATA McGraw Hill

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Matrix methods of Structural Analysis	Weaver and Gere	-	McGraw Hill

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CV504T(ii)	PE – I Advanced Surveying	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
At the end of course, students will be able to: 1. Determine the relative position of any objects or points on the earth. 2. Determine the distance and angle between different objects. 3. Prepare a map or plan to represent an area on a horizontal plane. 4. Develop methods through the knowledge of modern science and the technology and use them in the field.	At the end of course, students will be able to: 1. Acquire the knowledge of geodetic surveying. 2. Apply the concepts of photogrammetric surveying. 3. Develop the concepts of total station. 4. Design and set out various curves. 5. Explain the utility of GIS, GPS, remote sensing and drones in given civil engineering problems.

Unit I	**[9 Hrs]**
Triangulation: Classification of Triangulation System and its Figures, Intervisibility and Height of Stations, Satellite station and Reduction to Centre **Survey Adjustments**: Kinds of errors, Laws of accidental errors, Laws of weights, Normal equations, Determination of most probable values	
Unit II	**[9 Hrs]**
Photogrammetric Surveying: Introduction, Basic principles and Definitions, Photo-Theodolite, Determination of focal length of the lens, Aerial Camera, Scale of a Vertical Photograph, Relief Displacement, Flight planning	
Unit III	**[9 Hrs]**
Total Station: Introduction, Advantages and Disadvantages, Types, Fundamental Parameters, Precautions, Setting up, Construction Layout, Measurement of Horizontal and Vertical Angles, Measurement of Distances and Coordinates	
Unit IV	**[9 Hrs]**
Curves: Simple curves, Compound curves, Reverse curves, Vertical curves and Transition curves	
Unit V	**[9 Hrs]**
GIS & GPS: Introduction, principle and applications. **Remote Sensing**: Introduction and applications. **Drones**: Introduction and applications.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Surveying Volume - II	Dr. B.C. Punmia, Er. Ashok K. Jain, Dr. Arun K. Jain	Seventeenth edition	Laxmi Publications (P) Ltd.
2	Surveying & Levelling PART 2	T.P. Kanetkar, S.V. Kulkarni	Twenty third edition	Pune Vidyarthi Griha Prakashan
3	Advanced Surveying- Total station, GIS and Remote Sensing	Satheesh Gopi. R. Sathikumar and N. Madhu	Second edition	Pearson Publication
4	Surveying & Levelling	N. N. Basak	Second edition	McGraw Hill

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Higher Surveying	Chandra A.M.	Third edition	New Age International (P) Limited
2	Remote sensing and Geographical information system	Anji Reddy M	Second edition	B. S. Publications

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CV505T	Technical Skill Development – II	2	-	-	2	50	-	50

Course Objectives	Course Outcomes
	At the end of course students will be able to 1. Summarize the use of software available in civil engineering. 2. Modelling and analyze the multistoried building model(s) with the use of software.

Minimum EIGHT experiments to be performed from the list as below

Sr. No.	Topic
1	Introduction to software(s) such as STAAD, SAP, E-Tabs, etc.
2	Modelling and analysis of multistoried residential building with the use of any one of the software mentioned above.
3	One Micro Project.

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CV541P	Career Development – V	-	-	2	1	50	-	50

Course Objectives	Course Outcomes
To enhance students' aptitude, analytical reasoning, communication, teamwork, and professional presentation skills required for competitive examinations, higher education, and workplace success.	**CO1.** Students will be able to solve problems related to time and work, pipe and cisterns, geometry, mensuration, and analytical puzzles using logical and quantitative reasoning skills. **CO2.** Students will be able to apply concepts of time, speed, and distance and solve coding-decoding and direction sense problems accurately using analytical thinking. **CO3.** Students will be able to perform SWOC analysis, set SMART goals, and deliver effective self-introductions with confidence and professional communication skills. **CO4** Students will be able to conduct company profile presentations and participate effectively in table topic group discussions demonstrating teamwork, critical thinking, and spontaneous speaking skills. **CO5.** Students will be able to demonstrate improved verbal ability, grammar, vocabulary, reading comprehension, and active classroom participation for professional communication.

Unit I (15marks)	**[7Hrs]**
Time and Work, Chain Rule, Pipe and Cistern, Geometry and mensuration **Puzzles:-** Analytical puzzle, Tabular Puzzle, Box or Floor based Puzzle, Rank based Puzzle	
Unit II (10marks)	**[7Hrs]**
Time Speed and Distance:- Basic Problems, Average Speed, Relative Speed, Problems on Trains, Boats and Streams, Escalators, Directions sense Problems Coding and Decoding	
Unit III (5marks)	**[5Hrs]**
SWOC Analysis and SMART Goal Setting - for Personal and Professional Development **Self-Elevator Pitch –** Self Introduction, Confidence Building, and Professional Communication Skills (5marks)	
Unit IV (10marks)	**[6Hrs]**
Company Profile Group Presentation – Research, Team Coordination, and Presentation Techniques (5marks) **Table Topic Group Discussion –** Critical Thinking, Spontaneous Speaking, and Team Interaction	
Unit V (10marks)	**[3Hrs]**
Verbal Ability Quiz – Grammar, Vocabulary Building, and Reading Comprehension for Professional Communication **Continuous Assessment -** 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 Publication
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	Developing Communication Skills	Krishna Mohan & Meera Banerji	2002	
3	Professional Communication Skills	Alok Jain	2006	S Chand & Company Ltd.
4	Personality Development & Soft Skills	Barun Mitra	2019	Cambridge University Oress

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CV531M	Building Planning and Construction	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. To understand fundamentals of building materials and components. 2. To recognize the importance building planning and good construction practices.	At the end of the course, the student will be able to 1. Recognize building types and its components. 2. Identify the building materials and their use. 3. Describe various types of building foundations & their suitability. 4. Recognize various components of a building in the superstructure 5. Understand provisions of national building code, bye laws and architectural composition

Unit I	**[9 Hrs]**
Introduction to Buildings: Definition, Building terminologies, factors affecting selection of a site for building construction, Requirements of a good building, Classification of buildings, Substructure & Super structure, Building Components and their role, Load bearing structure, Framed Structure, and Composite Structure.	
Unit II	**[6 Hrs]**
Basic Building Materials: Introduction to basic construction materials: cement: types & field tests, bricks: type & field tests, stones, AAC blocks, aggregates, reinforcing steel, structural glazing, structural steel; Concrete types: PCC, RCC, Prestressed Concrete, Precast Concrete, and Ready Mix Concrete. Use of Eco-friendly construction materials.	
Unit III	**[6 Hrs]**
Sub-Structure: Foundation, objectives of providing foundations, Classification: Shallow & Deep Foundations, Suitability of various sub – types of shallow & deep foundations.	
Unit IV	**[9 Hrs]**
Super-Structure: Brick masonry: types of bonds, relative merits and demerits of English, Single Flemish and Double Flemish bond, Stone masonry: General principles, classification of stone masonry and their relative merits and demerits **Stairs:** Terminology, requirements of good staircase, classification; ramps, lifts and escalators **Doors and Windows**: Classification & material	
Unit V	**[9 Hrs]**
Basics of Building Planning & Construction: Introduction to National Building Code, Good Construction Practices, principles of planning Building byelaws and terminologies, F.S.I., carpet area, built up area, setbacks, Simple area calculations based on building bye-laws. Study of various building plans.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Building Construction	Sushil Kumar	20	Standard Publishers Distributers
2	Building Construction	B.C. Punmia, Ashok kumar Jain and Arun kumar Jain	11	Laxmi Publication (P) Ltd.
3	Building Drawing with an Integrated Approach to Built Environment	M. G, Shah, C. M. Kale, S. Y. Patki	5	McGraw Hill Education (India) Private Limited

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Building Construction Materials & Techniques	Raj, P. Purushottam	-	Pearson Education
2	Building Construction	S.C. Rangwala	33	Charotar Publishing House