



**KALINGA
UNIVERSITY**

SCHEME & SYLLABUS FOR

Bachelor of Vocational Studies (B.Voc.)

Building Construction Technology

W.e.f. 2022 – 2023



Ranked in
TOP 101-150
Universities

Kalinga University, Naya Raipur, Chhattisgarh

B. VOC IN BUILDING CONSTRUCTION TECHNOLOGY

Semester-01								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVBCT101	Basic Trades & Safety-I	4	3	1	0	30	70	100
BVBCT102	General Works Supervision-I	4	3	1	0	30	70	100
BVBCT103	General Education-I	4	3	1	0	30	70	100
BVBCT104P	Basic Trades & Safety-I Lab	2	0	0	4	20	30	50
BVBCT105P	General Works Supervision-I Lab	2	0	0	4	20	30	50
BVBCT106P	General Education-I Lab	6	0	0	12	50	100	150
BVBCT107P	Onsite Learning/Project/ Lab -I	8	0	0	16	50	150	200
Total		30	9	3	36	230	520	750

Semester-02								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVBCT201	Basic Trades & Safety-II	4	3	1	0	30	70	100
BVBCT202	General Works Supervision-II	4	3	1	0	30	70	100
BVBCT203	General Education-II	4	3	1	0	30	70	100
BVBCT204P	Basic Trades & Safety-II Lab	2	0	0	4	20	30	50
BVBCT205P	General Works Supervision-II Lab	2	0	0	4	20	30	50
BVBCT206P	General Education –II Lab	6	0	0	12	50	100	150
BVBCT207P	Onsite Learning/ Project/ Lab -II	8	0	0	16	50	150	200
Total		30	9	3	36	230	520	750
Semester-03								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVBCT301	Lab Technician-I	4	3	1	0	30	70	100
BVBCT302	Surveying-I	4	3	1	0	30	70	100
BVBCT303	General Education-III	4	3	1	0	30	70	100
BVBCT304P	Lab Technician-I Lab	2	0	0	4	20	30	50
BVBCT305P	Surveying-I Lab	2	0	0	4	20	30	50
BVBCT306P	General Education-III Lab	6	0	0	12	50	100	150
BVBCT307P	Onsite Learning/ Project/ Lab -III	8	0	0	16	50	150	200
Total		30	9	3	36	230	520	750

Semester-04								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVBCT401	Lab Technician-II	4	3	1	0	30	70	100
BVBCT402	Surveying-II	4	3	1	0	30	70	100
BVBCT403	General Education-IV	4	3	1	0	30	70	100
BVBCT404P	Lab Technician-II Lab	2	0	0	4	20	30	50
BVBCT405P	Surveying-II Lab	2	0	0	4	20	30	50
BVBCT406P	General Education-IV Lab	6	0	0	12	50	100	150
BVBCT407P	Onsite Learning/ Project/ Lab -IV	8	0	0	16	50	150	200
Total		30	9	3	36	230	520	750

Semester-05								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVBCT501	Site Accounts-I	4	3	1	0	30	70	100
BVBCT502	Regulatory Systems-I	4	3	1	0	30	70	100
BVBCT503	General Education-V	4	3	1	0	30	70	100
BVBCT504P	Site Accounts-I Lab	2	0	0	4	20	30	50
BVBCT505P	Regulatory Systems-I Lab	2	0	0	4	20	30	50
BVBCT506P	General Education-V Lab	6	0	0	12	50	100	150
BVBCT507P	Onsite Learning/ Project/ Lab -V	8	0	0	16	50	150	200
Total		30	9	3	36	230	520	750

Semester-06								
Course Code	Course Title	Credits	L	T	P	Internal Marks	End Semester Exam Marks	Total Marks
BVBCT601	Site Accounts-II	4	3	1	0	30	70	100
BVBCT602	Regulatory Systems-II	4	3	1	0	30	70	100
BVBCT603	General Education-VI	4	3	1	0	30	70	100
BVBCT604P	Site Accounts-II Lab	2	0	0	4	20	30	50
BVBCT605P	Regulatory Systems-II Lab	2	0	0	4	20	30	50
BVBCT606P	General Education-VI Lab	6	0	0	12	50	100	150
BVBCT607P	Onsite Learning/ Project/ Lab -VI	8	0	0	16	50	150	200
Total		30	9	3	36	230	520	750

SEMESTER-01

BASIC TRADES & SAFETY - I

BVBCT101

Unit 1:	06
• Mason, Bar-Bender, Store keeper, Shuttering Carpenter, Blaster.	
Unit 2:	06
• Dumper Operators, Excavator, Tiler, Plasterer, Carpenter.	
Unit 3:	06
• Introduction to Construction Safety- Safety issues in construction- Human factors in construction safety management. Roles of various groups in ensuring safety in construction industry. Framing Contract conditions on safety, and related matters. Relevance of ergonomics in construction safety.	
Unit 4:	06
• Safety in various construction operations- Excavation- under- water works- under- pinning & shoring Ladders & Scaffolds- Tunneling- Blasting- Demolition- Pneumatic caissons confined Space Temporary Structures. Indian Standards on construction safety- National Building Code Provisions on construction safety. Safety in material handling and equipments- Safety in storage & stacking of construction materials.	
Unit 5:	06
• Safety in the use of construction equipments- Vehicles, Cranes, Tower Cranes, Lifting gears, Hoists & Lifts, Wire Ropes, Pulley blocks, Mixers, Conveyors, Pneumatic and hydraulic tools in construction. Temporary power supply.	
References:	
• Sushil Kumar, Building Construction	
• C. Punmia, Building Construction	
• Building Construction, Metchell	
• K.N.Vaid, Construction Safety Management	
• V.J. Davies and K.Tomasin, Construction Safety Handbook	
• James B.Fullman, Construction Safety, Security & Loss Prevention	

GENERAL WORK SUPERVISOR-I

BVBCT 102

Unit 1: **06**

- **Drawing of Building Elements:** Drawing of various elements of buildings like various types of footing, drawing of frames of doors, window, various types of doors, window and ventilator, lintels and arches, stairs and staircase, trusses, flooring, roofs etc.

Unit 2: **06**

- **Stones:** Occurrence, varieties, characteristics and their testing, uses.
- **Timber:** Important timbers and their engineering properties and use. Defects in timber, need for wood substitutes, alternate materials for shuttering doors/windows, partitions and structural members etc.
- **Brick and Tiles:** manufacturing, characteristics, classification and uses.
- **Flooring:** types of flooring and their characteristics.

Unit 3: **06**

- **Advance Construction Materials:** Use of fly ash in mortars, concrete, fly ash bricks, D.P.C. materials, building materials made by industrial & agricultural waste, clay products P.V.C. Materials, advance Materials For Flooring, Doors & Windows, Fascia material, interiors materials for plumbing, sanitation & electrification.

Unit 4: **06**

- **Foundation:** Types of foundations, wall footings, grillage, foundations, well foundation, under reamed piles, Damp proof courses.
- **Masonry and Walls:** Brick masonry, Bonds, Stone masonry, masonry construction, precast stone masonry block, Hollow concrete block, plastering and pointing, white and color washing, distemping, dampness and its protection.
- **Doors, Windows and Ventilators:** Types, based on material etc., size location, fittings, construction of sunshades, sills and jambs, RCC doors/windows frames.

Unit 5: **06**

- **Floors and Roofs:** Types, minimum thickness, construction, floor finishes, Flat roofs, solid slab and timber roofs, pitched roofs, false ceiling, roof coverings, Ferrocement roofing units, water proofing.
- **Services:** Water supply & Drainage, Electrification, Fire protection, thermal insulation, Air Conditioning, Acoustics & Sound insulation.

References:

- Chakraborty; Building Drawing
- Shah, Kale & Patki; Building Design and Drawing; TMH
- Sushil Kumar; Building Construction
- B.C. Punmia; Building Construction
- S.Gurucharan Singh & Jagdish Singh Building Planning, Design and Scheduling
- Malik & Meo; Building Design and Drawing
- Building Construction, Metchell

GENERAL EDUCATION-I

BVBCT 103

Course Objectives:

- To Inculcate in group learning and improve communication Skills, & Values.
- To enable the students to interact and communicate with management and labor in field of construction work.
- The multiplicity of interrelated factors which influence the behavior and performance of people as members of work organizations.

Unit 1: 10

- **Health, Physical Education & Human Values-I**

Unit 2: 10

- **Soft Skills**
 - English Fluency Development-I
 - Building Self Confidence-I
 - Communication Skills-I
 - Attitude Building-I
 - Presentation Skills-I

Unit 3: 10

- **Information & Communication Technology:**
 - Computer: An Introduction
 - Generation of computers & types: PC, PC/XT, PC/AT. Main Frame.
 - Super Lap top, Pam Top
 - Data Representation
 - Bit, Nibble, Byte, Word
 - Number System: Decimal, Binary, Hexadecimal & their Conversions
 - Arithmetic Operations (Addition, Subtraction using Binary Number System)
 - Idea of Hardware and software
 - Idea of Firmware, free ware & Human Ware

BASIC TRADES & SAFETY-I LAB

BVBCT104P

GENERAL WORKS SUPERVISION-I LAB

BVBCT105P



GENERAL EDUCATION-I LAB

BVBCT106P

ONSITE LEARNING/ PROJECT/ LAB -I

BVBCT107P

- **Field Test of Below Materials**
 - ✓ Cement
 - ✓ Sand
 - ✓ Aggregates
- **Bricks**
- **Setting Out of Building Plan**
- **Various types of the construction equipment**
- **Basic engineering drawings**
- **Types of Brick Bonds**
- **Field Visit & Training (Min. 20 Days)**

SEMESTER-02

BASIC TRADES & SAFETY-II

BVBCT201

Unit 1:	06
• Plumber, Electrical Wireman, Electrical fitter, Welder, Stone Crusher Operators.	
Unit 2:	06
• Machine Operator, Roof Sheet Layers, Concrete mixer Operator, Concrete Vibrator Operator, and Safety Inspector.	
Unit 3:	06
• Industrial Safety: Factories Act-Definitions, Preliminary, Inspecting staff, Health, Safety, Provisions relating to hazardous processes, Welfare, Working hours of adults, Employment of young persons, Special provisions. Dock workers (Safety, Health and Welfare) Act and Regulations-Definitions, Powers of Inspectors, Obligation of dock workers. Duties of Safety Officers, Reporting of accidents, Emergency Action Plan, Safety Committee.	
Unit 4:	06
• Basic concepts of Industrial Hygiene, Environmental factors of stress-Chemical Hazards, Physical Ergonomically Biological Hazards, Threshold Limit Values (TLV) Short Term Exposure Limit (STEL), Maximum Tolerable Exposure Limit (MTEL).	
Unit 5:	06
• Fire Safety of Building: Causes and effects of fire, How to Limit fire spread, Fire resistance of Building, Fire resistance of concrete Buildings. Fire Prevention, Fire Detection, Fire Fighting systems in the Buildings, Use of different types of fire extinguishers.	
References:	
• Factories Act, 1948 with amendments of 1976 & 1987	
• Fundamentals of Industrial Hygiene by Barbara A. Plog & Patricia J. Quinlan	
• Safety at work by John Ridby & John Channing	
• Occupational Health & Safety in manufacturing Industries M K Potty	
• Carl Goodson, "Essentials of fire fighting" Fire protection publications; 5th edition	
• Practical Handbook on Building Construction. By Er. M.K.Gupta. (Nabhi Publication)	

GENERAL WORKS SUPERVISION-II

BVBCT202

- Unit 1:** **06**
- **Water Supply and sewerage:** Glossary of Water Supply, Sewerage and Drainage Terms, Space Parameters for plumbing and sanitary fittings, Parameters for safe Drinking Water, tools for plumbing Work, Bathroom fittings, G.I. Fittings, C.I Fittings, Types of Pipes, Jointing of Pipes, Septic Tanks and soak pit, Details of Sewer Manholes.
- Unit 2:** **06**
- **Electrical Work:** Symbols for electrical fittings and Installations, Electrical tools, testing and measuring Instruments, space Parameters for electrical fittings, electrical wiring, Notes on earthing, Applications of Ordinary test lamps in testing, Illustration of types of connections in Electrical Wiring, Tests in wiring Circuits, faults in electrical Circuits, Electricals Distribution, Electrical Transmission, Energy Saving Tips, Check list for Internal Electrical Wiring Work, Check list for cable laying.
- Unit 3:** **06**
- **Thermal and Sound Insulation of Buildings:** Sound Insulation, types of absorbent materials, Methods of sound Insulation, Thermal insulation, General Information, Insulation Materials, Methods of thermal Insulation.
- Unit 4:** **06**
- **Fire Safety of Building:** Causes and effects of Fire, how to limit fire spread, fire resistance of Building, Fire resistance of concrete buildings, fire prevention, Fire detection, firefighting systems in the buildings, Use of Different types of fire extinguishers.
- Unit 5:** **06**
- **Road Work:** Glossary of terms related to roadwork, some, types of Bituminous Materials, typical cross section of a bituminous road (Premix Bitumen Macadam), & Concrete Road. Types of Bituminous roads, typical Cross sections of various types of roads, typical drainage arrangements for roads, general defects observed on asphalt roads, & Concrete roads.
- References:**
- Practrical Handbook on Building construction Er. M.k. Gupta (NAbhi Publication)
 - Sushil Kumar; Building Construction
 - B.C. Punmia; Building Construction
 - Gurucharan Singh & Jagdish Singh Building Planning, Design and Scheduling
 - Malik & Meo; Building Design and Drawing
 - Building Construction, Metchell

GENERAL EDUCATION-II

BVBCT203

Course Objectives:

- To inculcate in group learning and improve communication Skills, & Values
- To enable the students to interact and communicate with management and labor in field of construction work
- The multiplicity of interrelated factors which influence the behavior and performance of people as members of work organizations

Unit 1: 10

- **Health, Physical Education & Human Values-II**

Unit 2: 10

- **Soft Skills**
 - English Fluency Development-II
 - Building Self Confidence-II
 - Communication Skills-II
 - Attitude Building-II
 - Presentation Skills-II

Unit 3: 10

- **Information & Communication Technology**
 - **Computer Language and Translators:**
 - ✓ Central Processing Unit (CPU)
 - ✓ **Input/output Devices:** Keyboard, Mouse (optical), Digitizer, Scanner, Web Camera, Monitor (CRT, TFT), Printers, plotters, Bar Code reader
 - ✓ Secondary Storage Devices
 - ✓ Block Diagram Showing Interconnection of Computer Parts
- **Operating System:**
 - ✓ Definition of Operating System (OS)
 - ✓ Types of OS
 - ✓ Single user - Multi Processing

BASIC TRADES & SAFETY-II LAB

BVBCT204P

GENERAL WORKS SUPERVISION-II LAB

BVBCT205P

GENERAL EDUCATION –II LAB

BVBCT206P

ONSITE LEARNING/ PROJECT/ LAB-II

BVBCT207P

- **Lab Test of Below Materials**
 - ✓ Cement
 - ✓ Sand
 - ✓ Aggregates
 - ✓ Bricks
- **Computer Laboratory**
 - ✓ Basic of Auto CAD
- **Field Visit & Training (Min. 20 Days)**

SEMESTER-03

LAB TECHNICIAN-I

BVBCT301

Basic Laboratory Techniques in Building Construction:

Unit 1:

06

Introduction to Building Construction Lab and Safety:

- Importance of laboratory techniques in building construction
- Lab safety rules and personal protective equipment (PPE)
- Handling of construction tools and equipment
- Fire safety and first aid in construction labs

Unit 2:

06

Testing of Construction Materials – Cement and Aggregates:

- Properties of cement (consistency, setting time, strength tests)
- Sieve analysis of fine and coarse aggregates
- Specific gravity and water absorption of aggregates
- Bulking of sand test

Unit 3:

06

Brick and Block Testing:

- Compressive strength of bricks and concrete blocks
- Water absorption and efflorescence tests
- Dimension and shape tests
- Field identification of different types of bricks

Unit 4:

06

Basic Concrete and Mortar Testing:

- Preparation of cement mortar and concrete cubes
- Slump test for workability of concrete
- Compaction factor test
- Compressive strength of concrete cubes

Unit 5:

06

Soil and Foundation Testing:

- Moisture content determination in soil
- Sieve analysis and grain size distribution
- Proctor compaction test
- Bearing capacity of soil (CBR test)

References:

- “Concrete Technology” – M.S. Shetty & A.K. Jain (S. Chand)
 - Covers cement, aggregates, concrete properties, and testing methods.
- “Building Materials” – S.K. Duggal (New Age International)
 - Details about construction materials, their properties, and testing methods.
- “Construction Materials and Testing” – Dr. P.P. Kandekar (S. Chand)
 - Focuses on laboratory tests of cement, concrete, soil, and aggregates.
- “Soil Mechanics and Foundations” – B.C. Punmia, Ashok K. Jain, Arun K. Jain (Laxmi Publications)
 - Covers soil testing methods and foundation design principles.
- “Materials of Construction” – D.N. Ghose (Tata McGraw Hill)
 - Discusses the physical and mechanical properties of construction materials.
- **IS Codes (Indian Standards) for Material Testing:**
 - IS 4031 – Cement Testing
 - IS 2386 – Aggregate Testing
 - IS 3495 – Brick Testing
 - IS 2720 – Soil Testing

SURVEYING-I

BVBCT302

Practical Instrumentation & Construction Monitoring:

Unit 1:

06

Total Station Surveying for Construction:

- Introduction to Total Station: Parts, Setup, and Calibration
- Simple Coordinate Capture: Measuring and Marking Building Corners
- Field Procedures: Setting Out Building Layouts
- Practical Exercises: Stake-out of Columns, Walls, and Slab Edges

Unit 2:

06 Leveling and As-Built Documentation:

- Recap of Auto-Level and Differential Leveling
- Field Applications: Checking Floor Levels, Beam Heights
- Creating Simple As-Built Drawings: Measuring and Sketching
- Practical Exercises: Floor Slab Leveling, Staircase Profiling

Unit 3:

06

Simple Monitoring Techniques:

- Crack Monitoring using Basic Tools (Crack Meters, Gauge)
- Tilt Measurement using Simple Instruments
- Settlement Measurement with Basic Leveling
- Practical Exercises: Recording and Reporting Observations

Unit 4:

06

Data Management & Reporting:

- Recording Field Data: Field Notes and Digital Formats
- Simple Data Processing: Calculating Areas, Volumes
- Introduction to Basic Surveying Software
- Preparing Simple Reports: Including Layout Plans and Level Books

Unit 5:

06

Site Survey Project:

- Planning a Small Site Survey: Identifying Survey Points and Boundaries
- Establishing Simple Control Points: Using Total Station and Auto-Level
- Data Collection: Measuring Distances, Angles, and Levels
- Data Analysis: Creating Basic Site Plans and Level Profiles
- Reporting and Presentation: Preparing a Simple Survey Report with Field Notes and Drawings
- Recording Field Data: Field Notes and Digital Formats
- Simple Data Processing: Calculating Areas, Volumes
- Introduction to Basic Surveying Software
- Preparing Simple Reports: Including Layout Plans and Level Books

References:

- “Surveying Vol. 1” – B.C. Punmia, Ashok K. Jain, Arun K. Jain (Laxmi Publications)
 - Covers fundamental principles of surveying, chain and compass surveying, and leveling.
- “Surveying and Leveling” – R. Subramanian (Oxford University Press)
 - Explains chain, compass, and plane table surveying with practical examples.
- “Plane Surveying” – A.M. Chandra (New Age International)
 - Provides details on linear measurement, leveling, and contouring.
- “A Textbook of Surveying” – C.L. Kochher (Dhanpat Rai Publications)
 - Includes measurement techniques, field procedures, and error adjustments.
- **IS Codes for Basic Surveying:**
 - IS 1492 – Chain Surveying
 - IS 6962 – Compass Surveying
 - IS 3993 – Leveling

GENERAL EDUCATION-III

BVBCT303

Communication Skills & Professional Ethics:

Unit 1:	06
Basics of Communication:	
<ul style="list-style-type: none">• Importance of communication in the construction industry• Types of communication (verbal, non-verbal, written)• Barriers to communication and overcoming them• Effective communication techniques	
Unit 2:	06
Business and Technical Writing:	
<ul style="list-style-type: none">• Writing official letters, emails, and reports• Preparation of tenders, contracts, and project reports• Technical documentation in construction projects• Presentation skills and public speaking	
Unit 3:	06
Interpersonal Skills and Teamwork:	
<ul style="list-style-type: none">• Importance of teamwork in construction projects• Leadership and negotiation skills• Conflict resolution in the workplace• Professional ethics in construction	
Unit 4:	06
Legal and Ethical Aspects in Construction:	
<ul style="list-style-type: none">• Labor laws and workers' rights• Safety regulations and workplace ethics• Environmental ethics in construction• Case studies on ethical issues in construction	
Unit 5:	06
Digital Communication and Soft Skills:	
<ul style="list-style-type: none">• Use of digital platforms for communication• Resume writing and job interview preparation• Time management and productivity enhancement• Business etiquette and professional conduct	

References:

- “Technical Communication: Principles and Practice” – Meenakshi Raman & Sangeeta Sharma (Oxford University Press)
 - Covers technical writing, business communication, and presentation skills.
- “Business Communication” – K.K. Sinha (Taxmann Publications)
 - Focuses on effective communication strategies in the corporate world.
- “Professional Ethics and Human Values” – R. S. Naagarazan (New Age International)
 - Discusses ethics in the workplace, legal issues, and corporate responsibility.
- “Effective Technical Communication” – M. Ashraf Rizvi (McGraw-Hill)
 - Covers report writing, documentation, and professional communication skills.
- **“Soft Skills: Enhancing Employability”** – M. S. Rao (Wiley India) Includes leadership, teamwork, and digital communication skills.

LAB TECHNICIAN-I LAB

BVBCT304P

SURVEYING-I LAB

BVBCT305P

Practical Components & Exercises:

- Weekly field practice on instrument setup and data recording
- **On-site layout exercises:** Setting out walls, slabs, and columns
- **Mini-Project:** End-of-term site survey with basic as-built documentation
- **Data interpretation:** Plotting levels, coordinates, and construction elements

GENERAL EDUCATION-III LAB

BVBCT306P

ONSITE LEARNING/ PROJECT/ LAB –III

BVBCT307P

Basic Construction Practices & Site Safety:

Unit 1:

Introduction to Onsite Construction Practices:

- Understanding construction drawings and specifications
- Site layout and preparation
- Foundation marking and excavation

Unit 2:

Material Handling and Storage

- Identification and testing of construction materials
- Proper storage and handling of cement, sand, bricks, and steel
- Methods of mixing and curing concrete

Unit 3:

Masonry and Concreting Works:

- Brickwork and blockwork techniques
- Reinforcement placement and formwork installation
- Concreting process – mixing, pouring, curing

Unit 4:

Safety Measures at Construction Sites:

- Personal Protective Equipment (PPE) usage
- Site safety regulations and emergency procedures
- Hazard identification and risk assessment

Unit 5:

Field Visits and Report Writing:

- Practical exposure to real construction sites
- Report preparation on observations and learning outcomes
- Case studies on safety incidents and corrective actions

References:

- “Building Construction” – B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain (Laxmi Publications) o Covers fundamental construction practices, materials, and techniques.
- “Construction Technology” – Roy Chudley & Roger Greeno (Pearson) o Provides step-by-step construction processes with illustrations.
- “Construction Planning, Equipment, and Methods” – Robert L. Peurifoy, Clifford J. Schexnayder (McGraw-Hill) o Discusses construction site operations, materials, and machinery usage.
- “Fundamentals of Building Construction: Materials and Methods” – Edward Allen & Joseph Iano (Wiley) o Covers construction methods, material handling, and site safety.
- “Safety, Health and Environment Handbook” – R.K. Jain & Sunil S. Rao (Khanna Publishers) o Focuses on safety protocols, accident prevention, and risk assessment.

SEMESTER - 04

LAB TECHNICIAN-II

BVBCT401

Advanced Laboratory Techniques in Building Construction:

Unit 1:	06
Concrete Mix Design and Testing:	
<ul style="list-style-type: none">• Concrete mix design as per IS 10262• Tensile and flexural strength tests of concrete• Water permeability and durability tests• Accelerated curing test	
Unit 2:	06
Advanced Structural Testing:	
<ul style="list-style-type: none">• Tensile and compression testing of reinforcement steel• Bending test on steel rods• Load testing on RCC beams and slabs• Shear strength testing of concrete	
Unit 3:	06
Building Material and Finishing Testing:	
<ul style="list-style-type: none">• Testing of timber (moisture content, strength, hardness)• Paint adhesion and drying tests• Plaster and putty strength tests• Quality checks on tiles and stone finishes	
Unit 4:	06
Plumbing and Water Supply System Testing:	
<ul style="list-style-type: none">• Water quality testing (pH, hardness, turbidity)• Leakage detection and flow measurement in plumbing systems• Pressure testing of pipes• Drainage and sewerage system checks	
Unit 5:	06
Non-Destructive Testing (NDT) and Smart Construction Techniques	
<ul style="list-style-type: none">• Rebound hammer test for concrete strength assessment• Ultrasonic pulse velocity test• Thermographic inspection for insulation defects• Introduction to digital construction tools (BIM, IoT in construction)	

References:

- “Advanced Concrete Technology” – John Newman & Ban Seng Choo (Butterworth Heinemann)
 - Covers advanced concrete mix design and testing methods.
- “Laboratory Manual in Highway Engineering” – S.K. Khanna & C.E.G. Justo (Nem Chand & Bros)
 - Covers bitumen testing, pavement material testing, and road construction lab techniques.
- “Strength of Materials” – R.K. Bansal (Laxmi Publications)
 - Explains structural testing methods for steel, RCC, and load analysis.
- “Testing of Concrete in Structures” – Bungey, Sutherland, & Millard (CRC Press)
 - Covers non-destructive testing (NDT) techniques for concrete and RCC structures.
- “Plumbing Engineering” – R. G. Hopkinson (McGraw-Hill)
 - Focuses on plumbing systems, water supply, and drainage testing.
- **IS Codes for Advanced Testing:**
 - IS 10262 – Concrete Mix Design
 - IS 456 – Reinforced Concrete Design
 - IS 13311 – Non-Destructive Testing of Concrete
 - IS 3370 – Water Supply & Plumbing Testing

SURVEYING-II

BVBCT402

Advanced Surveying Techniques:

Unit 1:	06
Theodolite Surveying:	
• Introduction to Theodolite and its components	
• Measurement of horizontal and vertical angles	
• Theodolite traversing	
• Errors and adjustments in Theodolite	
Unit 2:	06
Tacheometric Surveying:	
• Principles of tacheometry	
• Types of tacheometric methods	
• Distance and elevation computations	
• Uses of tacheometry in building construction	
Unit 3:	06
Total Station and Electronic Surveying:	
• Introduction to Total Station and its working principle	
• Setting up and operating a Total Station	
• Data recording and transfer	
• Applications of Total Station in construction projects	
Unit 4:	06
GPS and Remote Sensing:	
• Basics of Global Positioning System (GPS)	
• Types of GPS and its applications in surveying	
• Introduction to Remote Sensing and GIS	
• Use of satellite imagery in surveying and mapping	
Unit 5:	06
Curve Setting and Construction Applications:	
• Types of curves (Simple, Compound, and Reverse curves)	
• Methods of setting out curves	
• Layout of buildings, roads, and drainage using surveying techniques	
• Practical applications of surveying in construction	

References:

- “Surveying Vol. 2” – B.C. Punmia, Ashok K. Jain, Arun K. Jain (Laxmi Publications)
 - Covers Theodolite, Tacheometry, Total Station, and GPS applications.
- “Advanced Surveying” – R. Agor (Khanna Publishers)
 - Discusses Theodolite traversing, remote sensing, and modern techniques.
- “Higher Surveying” – A.M. Chandra (New Age International)
 - Includes remote sensing, GIS, Total Station, and GPS fundamentals.
- “Fundamentals of Surveying” – S.K. Roy (PHI Learning)
 - A modern approach to surveying techniques, including electronic instruments.
- “GPS, Surveying, and Mapping” – Satheesh Gopi (Tata McGraw Hill)
 - Detailed coverage of GPS, Total Station, and digital surveying methods.
- IS Codes for Advanced Surveying:
 - IS 3091 – Theodolite Surveying
 - IS 8754 – Tacheometry
 - IS 14226 – GPS Surveying

GENERAL EDUCATION-IV

BVBCT403

Applied Mathematics for Construction:

Unit 1:	06
Basic Arithmetic and Algebra:	
• Ratios, proportions, percentages	
• Simple and compound interest calculations	
• Linear equations and their applications in construction	
Unit 2:	06
Geometry and Trigonometry:	
• Properties of geometric shapes used in construction	
• Pythagoras theorem and its applications	
• Basic trigonometry (sine, cosine, tangent) for surveying	
Unit 3:	06
Measurement and Estimation:	
• Units and conversions for length, area, and volume	
• Calculation of material quantities for construction	
• Cost estimation basics	
Unit 4:	06
Statistics and Probability in Construction:	
• Mean, median, mode, and standard deviation	
• Probability concepts in risk assessment	
• Quality control using statistical methods	
Unit 5:	06
Structural Mathematics:	
• Force, stress, and strain calculations	
• Bending moments and shear force calculations	
• Load calculations for simple structures	

References:

- “Engineering Mathematics” – B.S. Grewal (Khanna Publishers)
 - Covers algebra, trigonometry, and calculus applications in engineering.
- “Quantitative Techniques” – C.R. Kothari (Vikas Publishing)
 - Focuses on mathematical problem-solving in real-world applications.
- “Construction Mathematics” – Surinder Viridi & Roy Baker (Routledge)
 - Designed specifically for construction technology students.
- “Higher Engineering Mathematics” – H.K. Dass (S. Chand)
 - Includes statistics, probability, and structural mathematics.
- “Basic Civil Engineering” – Satheesh Gopi (Pearson)
 - Covers measurement, estimation, and surveying-related calculations.

LAB TECHNICIAN-II LAB

BVBCT404P



SURVEYING-II LAB

BVBCT405P

GENERAL EDUCATION-IV LAB

BVBCT406P

ONSITE LEARNING/ PROJECT/ LAB –IV

BVBCT407P

Surveying and Site Layout:

Unit 1:

Fundamentals of Surveying for Site Layout:

- Introduction to surveying instruments (Auto Level, Theodolite, Total Station)
- Site leveling and contouring techniques
- Setting out building foundations

Unit 2:

Field Applications of Chain and Compass Surveying:

- Conducting chain and compass surveys
- Measurement of distances and angles
- Plotting surveyed data

Unit 3:

Theodolite and Total Station Surveying:

- Horizontal and vertical angle measurement using a theodolite
- Total Station operation and data recording
- Application in road and building layout

Unit 4:

GPS and Digital Mapping:

- Basics of GPS surveying
- Introduction to GIS and mapping software
- Digital topographical survey methods

Unit 5:

Surveying Project & Report Writing:

- Site survey for a residential/commercial project
- Documentation and analysis of survey data
- Report preparation with maps and layouts

References:

- “Surveying Vol. 1 & 2” – B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain (Laxmi Publications)
 - Covers chain surveying, leveling, theodolite, and total station applications.
- “Plane and Geodetic Surveying” – David Clark (Butterworth-Heinemann)
 - Detailed explanation of surveying principles with modern applications.
- “Surveying for Engineers” – J. Uren & W.F. Price (Palgrave Macmillan)
 - A practical guide for field surveying and site layout techniques.
- “GPS and Surveying Applications” – Alfred Leick, Lev Rapoport (Wiley)
 - Explains GPS-based surveying and mapping technologies.
- “Advanced Surveying: Total Station, GIS, and Remote Sensing” – Satheesh Gopi (Pearson)
 - Covers modern surveying techniques with case studies.



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