



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Technology and Science
Choice Based Credit System (CBCS) in Light of NEP-2020
B.Tech. in Civil Engineering
(2021-2025)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE301	DCC	Construction Material and Construction Technology	60	20	20	30	20	3	0	2	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit.

*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

The students will be able to identify, use and apply available material and technique according to field requirement efficiently and economically.

Course Outcomes (COs):

The students should be able to:

1. Communicate building features and select the good quality material for safe and stable construction.
2. Apply appropriate technique or Material for economic construction at a particular place.
3. Provide various building services in building according to conditions and impart / introduce an aesthetic look to the building.
4. Solve the problems in construction and repair the building elements.

Syllabus:

UNIT I

9 Hrs.

Stones and Aggregate: Classification, Characteristics, and their uses, quarrying and dressing of stones.

Timber: Important timbers, their engineering properties and uses, defects in timber, seasoning and treatment.

Brick and Tiles: Manufacturing, characteristics, Classification and uses, Improved brick from inferior soils, Hand moulding brick table, Clay-fly ash brick table, Flooring tiles and other tiles and their characteristics.

UNIT II

8 Hrs.

Steel: Structural Steel & their Properties Reinforced Steel, Grades of Steel & Types, and Properties of Reinforced Steel.

Polymers: Types, Uses & Properties of Polymer.

Pavement Material: Bitumen, Tar, Asphalt Test on Bitumen, Grades of Bitumen.

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UNIT III

8 Hrs.

Foundation: Type of soils, bearing capacity, soil stabilization and improvement of bearing capacity, settlement, and safe limits. Spread foundations, wall footings, grillage, foundations well foundation, causes of failure and remedial measures; under reamed piles, foundation on shrinkable soils, black cotton soil, timbering for trenches, dewatering of foundations. Simple methods of foundation design, Damp proof courses, Repairs Techniques for foundations.

UNIT IV

10 Hrs.

Masonry and Walls: Brick masonry, Bonds, Jointing, Stone masonry, casting and laying, masonry construction, Brick cavity walls, Common defects in construction and their effect on strength and performance of walls, precast stone masonry block, Hollow concrete block, plastering and pointing, white and colour washing, distempering, dampness and its protection, Design of hollow block masonry walls.

Doors, Windows, and Ventilators: Types based on material etc., size location, fittings, construction sunshades, sills, and jambs, RCC doors/windows frames. Stair types, rule of proportionality etc., Repairs techniques for masonry, walls, doors & windows.

UNIT V

8 Hrs.

Floors and Roofs: Types, minimum thickness, construction, floor finishes, Flat roofs, RCC jack arch, reinforced brick concrete, solid slab and timber roofs, pitched roofs, false ceiling, roof coverings, Channel unit, cored unit, Waffle unit, Plank and Joist, Brick panel, L-Panel, Ferro cement roofing units, water proofing, techniques and materials for low-cost housing.

Text Books:

1. S.C. Rangwala; Engineering Materials. Charotar Pub House (RS) (1 January 2014)
2. Shetty MS; Concrete Technology; S Chand publishing co.
3. B.C. Punmia; Building Construction, Laxmi Publications; Eleventh edition (1 January 2016)

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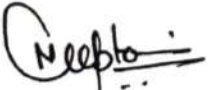
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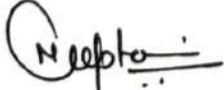
Reference Books:

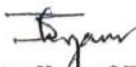
1. Mohan Rai & M.P. Jai Singh; Advance in Building Materials & Construction, Central Building Research Institute, Roorkee
2. Sushil Kumar; Building Construction, Standard Publisher Distributor

List of Practical's:

1. Determination of compressive strength of brick.
2. Determination of water absorption capacity of brick
3. Determine particle size distribution of coarse aggregate by sieving or screening.
4. Determine Angularity Number, flakiness index and elongation index.
5. Determine specific gravity of coarse aggregate.
6. Determine the soundness of aggregate.
7. Determine bulking of given sample of sand.
8. Determine specific gravity of fine aggregate.
9. Determine penetration value of bitumen.
10. Determine specific gravity of bitumen.


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BTCE 302	DCC	Mechanics of Solids	60	20	20	30	20	2	1	2	4

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Course Educational Objectives (CEOs):

To make aware the students, behaviour of structural members subjected to different kinds of stresses, forces like tension / compression, shear, bending, torsion etc. This subject deals as a base for the students in the structural engineering.

Course Outcomes (COs):

The students should be able to:

1. Recall the basic mechanical properties related to engineering materials.
2. Independently perform basic calculations and determine the internal mechanical stresses in loaded structural elements
3. Develop an understanding of the relation between material properties and strength of materials

Syllabus

UNIT I

8 Hrs.

Mechanical Properties of Materials: Strength, Stiffness, Elasticity, Plasticity, Toughness, Hardness, Ductility.

Elastic Behaviour of Bodies: Stress and Strain, Normal and Shear Stresses and Strains, Hooke's Law and Poisson's Ratio, Complementary Shear, Relations between the Elastic Constants, Complex stresses, Stresses on Oblique Planes, Principal planes and Principal stress and strains.

UNIT II

9 Hrs.

Bending Moment and Shear Force: Bending Moment and Shear Forces at a Section of Beam subject to Vertical Loads and Couples. Relation between Bending Moment and Shear Forces. And Loads. Graphical Methods for drawing B.M. diagram and S.F. diagram.

UNIT III

8 Hrs.

Stresses due to Bending and Shear: Theory of Bending Stresses due to Bending and Shear, Distribution of Stresses along the Section, Modulus of Section and Modulus of Rupture. Beams of varying Cross Section and Beams of uniform strength.

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UNIT IV

8 Hrs.

Deflection of Beams: Uniform Curvature, Relation between the Deflection, Curvature and Bending Moment. Slopes and Deflection of Beams, Macaulay's method, Conjugate beam method, Maxwell's reciprocal theorem.

UNIT V

9 Hrs.

Torsion of Shafts: Pure Torsion. Twisting of Solid and Hollow Circular Cross Sections. Stresses due to Torsion. Transmission of Power by Circular Shafts. Combined Bending and Twisting.

Text Books:

1. R.K. Rajput, Strength of Materials, Laxmi Publications.
2. Ramamurtham S., Strength of Materials, Dhanpat Rai Publications.
3. Punmia B.C., Strength of Material and Mechanics of Structure-Vol I., Standard Publishers Distributors.
4. Timoshenko S., Strength of Materials., CBS Publishers & Distributors.

Reference Books:

1. Ramamurtham, S, Strength of Materials, Dhanpat Rai and sons, New Delhi.
2. Punmia B C, Strength of Materials, Laxmi Publications (p) Ltd. New Delhi.
3. Surendra Singh, Strength of Materials., Stosius Inc/Advent Books Division

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List of Practical's:

1. Study of Universal testing Machine.
2. To determine the Compressive Strength of Materials.
3. To determine the Tensile Strength of Materials.
4. To determine the Brinell Hardness of Materials.
5. To determine the Rockwell Hardness of Materials.
6. To determine the Toughness of the materials.
7. To determine the stiffness of the spring.
8. To determine the deflection of Beam using deflection-beam apparatus.
9. To determine young's modulus of Elasticity of different materials of beam (simply supported).
10. To study the various types of Strain Gauge.

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BTCE303	DCC	Engineering Geology	60	20	20	30	20	3	0	2	4	

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Course Educational Objectives (CEOs):

The students will be able to understand, use and apply knowledge of geological processes and features to solve the problems related to the site selection efficiently and economically.

Course Outcomes (COs): The students should be able to:

1. Communicate Geological features and process.
2. Utilize geological materials for construction.
3. Design sustainable structures for particular set of landform/geological processes/features.
4. Select suitable site for safe, stable and economic construction.

Syllabus:

UNIT I

8 Hrs.

Physical Geology: Introduction to Geology, Objects and Scope of Geology; Physical Geology: Origin and Age of Earth, Layers and internal structure of Earth, Basic concepts of Continental Drift and Plate-Tectonics, Earthquake, Volcanoes, Weathering, Gradation: Wind, River, Glacial and Marine Erosion cycles, Soil formation, Soil Profile and Geological classification of Soil.

UNIT II

8 Hrs.

Mineralogy: Definition of Minerals, Physical and Chemical Properties of Minerals, Origin of Minerals, Classification of Minerals, Study of Common rock forming Minerals, Silica group, Feldspar group, Mica group, Pyroxene and Amphibole group, Common Ore Minerals and minerals of economic importance to civil engineering.

UNIT III

9 Hrs.

Petrology and Stratigraphy: Composition of Earth's Crust, Formation, Characteristics and Classification of Igneous, Sedimentary and Metamorphic Rocks, Brief study of granite, gabbro, dolerite, basalt, sandstone, limestone, shale, gneiss, schist, slate, marble and quartzite.

Geology of India: Physiographic features of India, Brief Geological history of India, Study of Main stratigraphic systems, and series of India with their economic importance.

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BTCE303	DCC	Engineering Geology	60	20	20	30	20	3	0	2	4

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UNIT IV

8 Hrs.

Structural Geology: Attitude of rocks and geological structures- strike and dip, Outcrop, Terminology, classification and engineering significance of folds, faults, joints and unconformities.

UNIT V

8 Hrs.

Applied Geology: Introduction to applied geology and its use in civil engg., properties of rocks, selection of sites for roads, bridges, dams, reservoirs and tunnels, stability of hill sides, water bearing strata, artesian wells, Use of remote-sensing techniques in selection of above sites.

Text Books:

1. Prabin Singh, A Textbook of Engineering and General Geology, S.K. Kataria & Sons, Eight edition: 2008
2. P. K. Mukerjee, A Textbook of Geology, World Press Private Ltd., Thirteenth Reprint Edition, 2019
3. S.K. Garg, Physical and Engineering Geology, Khanna Publishers, 1983

References:

1. Bangar, K.M., Principal of Engineering Geology, Standard Publishers, 2017
2. S. Ramamrutham, Engineering Geology, Dhanpat Rai Publishing Company Private Limited- New Delhi; First edition (1 January 2014)

List of Experiments.

1. Identification and study of important rock forming minerals
2. Identification and study of Industrial minerals
3. Identification and study of important ore minerals
4. Identification and study of Igneous rock
5. Identification and study of Sedimentary rock
6. Identification and study of Metamorphic rock
7. Study of River basin map of India
8. Study of Earthquake zone map of India
9. Study of Geological map and drawing profile section
10. Analysis of Geological features like Folds and Fault

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BTCE 304	DCC	Building Drawing and Planning	60	20	20	30	20	3	0	2	4

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Course Educational Objectives (CEOs):

The students will be able to:

1. To demonstrate planning of building and its elements according to circumstances effectively
2. To draw and dimension various types of doors, window, roof, stairs, and trusses.
3. To imagine the perspective view of buildings.
4. To design energy efficient building.

Course Outcomes (COs):

The students should be able to:

1. Demonstrate provisions of national building code, bye laws and architectural composition
2. Demonstrate drawing of building elements.
3. Describe building services with their line plan.
4. Do Planning and drawing of building plans efficiently.
5. Draw perspective view of simple objects and element of building

Syllabus

UNIT I

8 Hrs.

Planning of Building: Introduction to National Building Code, Building byelaws and terminologies, principles of planning (aspect, prospect, privacy etc), various principles of architectural composition.

UNIT II

8 Hrs.

Introduction of Building Elements and their Drawings: Drawing of various type of doors & window, Stair and their types, Design and Drawing of staircase like Dog legged, Open well, Types of trusses and roofs.

UNIT III

9 Hrs.

Building Amenity: Introduction and application: -Building Amenities like water supply and drainage, electrification, fire safety, thermal insulation: sun shading devices, acoustics of building. Line plan of building services like Water supply system and Electrification of building.

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UNIT IV

9 Hrs.

Detailed Planning and Drawing of Building: Planning and preparation of detailed drawings of various types of buildings like residential building, institutional buildings, etc.

UNIT V

8 Hrs.

Green Building and Perspective Drawing: Green Building and their concepts, Elements of perspective drawing involving simple problems, one point and two-point perspectives

Text Books:

1. R.S. Malik & G.S.Meo, Building Design and Drawing, Computech Publications Limited.
2. S.V Deodhar, Building Science & Planning, Khanna Publishers, Delhi.

References:

1. Shah, Kale & Patki; Building Design and Drawing; TMH
2. Gurcharan Singh & Jagdish Singh Building Planning, Design and Scheduling, Standard Publishers Distributors.

List of Experiments

1. Drawing of various types of staircases.
2. Drawing of various types of doors and windows
3. Sketches of various truss i.e., king post and queen post truss
4. One drawing sheet containing detailed planning of residential building
5. One drawing sheet containing detailed planning of institutional building
6. One drawing sheet containing water supply system of building.
7. One drawing sheet containing electrification system of building
8. One drawing sheet of one point perspective
9. One drawing sheet containing two-point perspective

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BTCE404	DCC	Surveying	60	20	20	30	20	3	0	2	4

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Course Educational Objectives (CEOs):

1. To understand the principles of land and hydrographic surveying
2. To know the application of surveying in civil engineering projects

Course Outcomes (COs):

Students at the end of the course will be able to

1. Choose modern survey equipment's to measure angles and distances
2. Extend the knowledge to other civil engineering field
3. Analyse and solve the problems related to survey

Syllabus

UNIT I

8 Hrs.

Traversing: Theodolite, Field work checks, traverse computations, latitude and departures, adjustments, computations of co-ordinates, plotting & adjusting or traverse, Omitted measurements, Measurement EDM, Trigonometrical leveling.

UNIT II

9 Hrs.

Trigonometric Leveling: Introduction; Determination of the level of the top of an object, Determination of the height of the object when the two instrument stations are not in the same vertical plane; Axis signal correction; Difference in elevation by single observation and reciprocal observations.

UNIT III

8 Hrs.

Tachometry: Tachometric systems and principles, stadia system, uses of analytic lens, tangential system, sublease system, instrument constant, field work reduction, direct-reading tacheometers, use of tacheometry for traversing and contouring.

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BTCE404	DCC	Surveying	60	20	20	30	20	3	0	2	4

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT IV

8 Hrs.

Curves: Classification and use; elements of circular curves, calculations, setting out curves by offsets and by theodolites, compound curves, reverse curves, transition curves, cubic spiral and lemniscates, vertical curves, setting out.

UNI V

9 Hrs.

Hydrographic Surveying: Soundings, methods of observations, computations and plotting. Principles of photographic surveying, aerial photography, tilt and height distortions, Remote sensing, simple equipments, elements of image interpretation, image-processing systems

Text Books:

1. B.C. Punmia, Surveying Vol. I, II, III, Laxmi Publications New Delhi
2. T.P. Kanetkar, Surveying & Levelling, Vol. I & II. Duggal; Surveying vol I and II; TMH
3. Basak; Surveying and Levelling; TMH

Reference Books:

1. R.E.Devis, Surveying theory & Practice, Mc.Graw Hill, New York
2. David Clark & Clendinning, Plane & Geodetic surveying Vol. I & II, constable & Co. London..
3. K.R. Arora, Surveying Vol. I & II, standard book House, New Delhi

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Shri Vaishnav Institute of Technology and Science
Choice Based Credit System (CBCS) in Light of NEP-2020
B.Tech. in Civil Engineering
(2021-2025)

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE404	DCC	Surveying	60	20	20	30	20	3	0	2	4

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List of Practical's:

1. Determination of elevation of various points with Dumpy Level by collimation plane method & rise and fall method.
2. Fixing benchmark with respect to temporary bench mark with Dumpy level by fly levelling & check levelling.
3. L section & Cross section of the road (one full size drawing sheet each for L-section & cross section).
4. Measurement of horizontal angles with the help of theodolite by method of repetition.
5. Measurement of vertical angles with theodolite.
6. Determination of horizontal distance between two inaccessible points with theodolite.
7. Locating given building by theodolite traversing (One full size drawing sheet).
8. Locating given building by plane table surveying (One full size drawing sheet).
9. Three-point problem in plane table surveying.
10. Determination of elevation of point by trigonometric levelling.
11. Counter plan of given area (On full size drawing sheet).
12. Study of planimeter.
13. Determination of area of irregular figure by using planimeter.
14. To give layout for given plan of building.
15. Study of total station.

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