

**Chhattisgarh Swami Vivekanand Technical University, Bilai**  
**SCHEME OF TEACHING & EXAMINATION**  
**BE (Civil Engineering) III Semester**

Sl. No.	Board of Study	Subject Code	Subject	Period per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	ESE	CT	TA		
1	Appl. Mathematics	320351(14)	Mathematics III	4	1	-	80	20	20	120	5
2	Civil Engg	320352(20)	Fluid Mechanics – I	4	1	-	80	20	20	120	5
3	Civil Engg	320353(20)	Surveying – I	3	1	-	80	20	20	120	4
4	Civil Engg	320354(20)	Mechanics of Solids	3	1	-	80	20	20	120	4
5	Civil Engg	320355(20)	Building Materials	3	1	-	80	20	20	120	4
6	Civil Engg	320356(20)	Engineering Geology	3	1	-	80	20	20	120	4
7	Civil Engg	320361(20)	Fluid Mechanics – I Lab	-	-	3	40		20	60	2
8	Civil Engg	320362(20)	Surveying Field Work- I	-	-	3	40		20	60	2
9	Civil Engg	320363(20)	Materials Testing Lab	-	-	3	40		20	60	2
10	Civil Engg	320364(20)	Engineering Geology Lab	-	-	3	40		20	60	2
11	Humanities	320365(46)	Value Education	-	-	1			40	40	1
12			Library	-	-	1					
			<b>Total</b>	<b>20</b>	<b>6</b>	<b>14</b>	<b>640</b>	<b>120</b>	<b>240</b>	<b>1000</b>	<b>35</b>

**L: Lecture, T: Tutorial, P: Practical, ESE: End Semester Exam, CT: Class Test, TA: Teachers Assessment**

**Note: Duration of all theory papers will be of Three Hours.**

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program: **Bachelor of Engineering**

Branch: **Civil Engineering**

Subject: **Mathematics - III**

Semester: **III**

Code: **320351(14)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Class Tests: **Two (Minimum)**

Assignments: **Two (Minimum)**

ESE Duration: **Three Hours**

**Maximum Marks: 80 Minimum Marks: 28**

## Course Objectives:

1. Make student to understand Fourier Series.
2. To understand the Laplace Transform.
3. To understand the Partial Differential Equation..
4. To provide an understanding about Complex variables
5. To understand statistics

**UNIT-I FOURIER SERIES:** Euler's Formula, Functions having points of discontinuity, Change of interval, Even & Odd functions, Half range series, Harmonic analysis.

**UNIT-II LAPLACE TRANSFORM:** Definition, Transform of elementary functions, Properties of Laplace transform, Transform of derivatives & integrals, Multiplication by  $tn$ , Division by  $t$ , Evaluation of integrals, Inverse Laplace Transform, Convolution theorem, Unit step function, Unit impulse function, Periodic function, Application to solution of ordinary differential equations.

**UNIT-III PARTIAL DIFFERENTIAL EQUATION:** Formation, Solution by direct integration method, Linear equation of first order, Homogeneous linear equation with constant coefficients, Non-homogeneous linear equations, Method of separation of variables.

**UNIT-IV COMPLEX VARIABLES:** Derivative, Cauchy-Riemann equations, Analytic functions, Harmonic functions, Flow problems, Complex integration, Cauchy theorem, Cauchy integral formula, Taylor & Laurent series, Singularity, Residue, Evaluation of real definite integrals.

**UNIT-V STATISTICS:** Random variables, Discrete & continuous probability distributions, Expectation, Mean & Standard Deviation, Moments & moment generating function, Distributions- Binomial, Poisson and Normal distributions.

## Text Books:

1. Higher Engg. Mathematics by Dr. B.S. Grewal– Khanna Publishers.
2. Advanced Engg. Mathematics by Erwin Kreyszig – John Wiley & Sons.

## Reference Books:

1. Advanced Engg. Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.
2. Applied Mathematics by P.N. Wartikar & J.N. Wartikar. Vol- II– Pune Vidyarthi Grih Prakashan, Pune
3. Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH.

## Course Outcome:

1. Students are expected to understand Fourier Series
2. Students are expected to understand LAPLACE TRANSFORM
3. Students are expected to understand PARTIAL DIFFERENTIAL EQUATION
4. Students are expected to understand COMPLEX VARIABLES and STATISTICS

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program:	<b>Bachelor of Engineering</b>	Semester:	<b>III</b>
Branch:	<b>Civil Engineering</b>	Code:	<b>320352(20)</b>
Subject:	<b>Fluid Mechanics – I</b>	Total Tutorial Periods:	<b>10</b>
Total Theory Periods:	<b>40</b>	Assignments:	<b>Two (Minimum)</b>
Class Tests:	<b>Two (Minimum)</b>	<b>Maximum Marks: 80</b>	<b>Minimum Marks: 28</b>
ESE Duration:	<b>Three Hours</b>		

## Course Objectives:

1. Be familiar with different fluids
2. Be familiar with different fluids flow condition.
3. Learning different flow & losses in pipes.
4. Be familiar with flow in open channel & different sections.

- UNIT- I** INTRODUCTION -Fluid and continuum, physical properties of fluids ideal and real fluid, Newtonian and Non-Newtonian Fluid. Fluid Statics-Pressure density height relationship, pressure measurement by Manometers, Pressure on plane and curved surfaces, centre of pressure, buoyancy, stability of immersed and floating bodies, metacentric height,
- UNIT-II** Kinematics of fluid flow -Steady and unsteady flow, uniform and non uniform flow, laminar and turbulent flow, one, two and three dimensional flow, streamlines, streak lines and path lines, circulation and vorticity, rotational and irrotational flow, velocity potential and stream function, continuity equation.
- UNIT- III** Dynamics of fluid flow-Euler's equation of motion along a streamline and its integration, Bernoulli's equation and its applications – Pitot tube, Venturimeter, orificemeter, nozzles, momentum equation and its application to stationary and moving plates/vanes, pipe bends, problems related to combined application of energy and momentum equations.
- UNIT-IV** Flow in Pipes-Reynolds's experiment, experimental determination of critical velocity, transition from laminar to turbulent flow, Laminar flow through circular tubes, flow between parallel plates, minor losses in pipe lines, loss due to sudden contraction, expansion, etc; Hot wire anemometer and LDA.Flow in open ChannelComparison between open channel and pipe flow, definition of uniform and non-uniform flow, uniform flow formulae, Chezy's and Manning's Formula, Hydraulically efficient channel section of rectangular, trapezoidal and circular type.
- UNIT-V** Flow through mouthpiece and orifices-Hydraulic coefficients of orifice, bell method orifice, mouthpieces, Borda's mouthpiece, running free and submerged.Notches and Weirs-Rectangular, triangular and trapezoidal notches and weir, cippoletti and broad crested weir, aeration of nappe, cavitations submerged weir.

## Text Books:

1. Fluid Mechanics and Machines – Dr. A.K. Jain (Khanna Publications)
2. Fluid Mechanics and Machines – Dr. R.K. Bansal (Laxmi Publications)
3. Fluid Mechanics – Dr. P.N. Modi (Standard Book House)

## Reference Books:

1. Mechanics of Fluid – Irving H. Shames (McGraw Hill)
2. Introduction to Fluid Mechanics – James A. Fay (Prentice Hall India)
3. Fluid Mechanics – R.J. Garde (New Age International Publication)
4. Fluid Mechanics – Streeter V.L. & Wylie E.B. (Tata McGraw Hills)
5. Fluid Mechanics – John F. Douglos (Pearsons)

## Course Outcomes:

1. Students are expected to understand different types of fluids.
2. Students are expected to compare fluids flow condition.
3. Students are expected to understand & evaluate flow in pipes & losses.
4. Students are expected to compare flow of fluids

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program:	<b>Bachelor of Engineering</b>	Semester:	<b>III</b>
Branch:	<b>Civil Engineering</b>	Code:	<b>320353(20)</b>
Subject:	<b>Surveying – I</b>	Total Tutorial Periods:	<b>10</b>
Total Theory Periods:	<b>40</b>	Assignments:	<b>Two (Minimum)</b>
Class Tests:	<b>Two (Minimum)</b>	<b>Maximum Marks: 80</b>	<b>Minimum Marks: 28</b>
ESE Duration:	<b>Three Hours</b>		

## Course Objectives:

1. To provide basic knowledge about principles of surveying for location, design and construction of engineering projects
2. Students develop skills using surveying instruments including measuring tapes, automatic levels, theodolites, and electronic distance measurement equipment.
3. The ability to identify error sources and the procedures to minimize errors.
4. Use standard survey tools
5. Understand and apply measurement error, accuracy, precision and techniques to improve accuracy of surveys

- UNIT- I**    **Leveling** - Different methods of determining elevations: Spirit, Trigonometric, Barometric and Photogrammetric methods, Spirit leveling-Definitions of terms, Principle, Construction, Temporary and permanent adjustment of levels. Sensitivity of bubble tube, Automatic levels, Leveling staves, Methods of spirit leveling Booking and reduction of field notes, Curvature and refraction, Reciprocal leveling Plotting of profiles, Barometric leveling, Trigonometric leveling-simple and reciprocal observations
- UNIT-II**    **Contouring** - Direct and Indirect methods of contouring. Interpolation of contours, Drawing section from contour map, Application and Modern methods of depicting relief on a Map. **Minor Instruments**- Construction and field use of altimeter, Description and use of Hand level, Abney Level, clinometers, ceylonghat tracer, Box Sextant, Pentagraph, planimeter, ediograph.
- UNIT- III**    **Theodolite And Traversing**- Venire and microptic theodolites, Temporary and permanent adjustments, Requirements of non-adjustable parts, Measure of horizontal and vertical angles by different methods Principle of traversing by theodolite, Field work and checks,
- UNIT-IV**    **Traverse Computations and Plane Table Survey** - Computation of coordinates, Source of errors, Precision of traversing, Checking and Balancing the traverses, Principles, Advantages and disadvantages, Plane table equipment, Different methods of Plane Table Surveying, Resection-Two and Three point problems. Fields work in Plane Table Surveying and contouring.
- UNIT-V**    **Curves** - Classification of curves; Elements of Circular, compound, Transition and Vertical curves, Theory and method of setting out Simple, Transition, compound and Vertical curves with field problems.

## Text Books:

1. Surveying (Vol. I & II) – Punmia, B.C. (Laxmi Publications, New Delhi, 1996)
2. Surveying (Vol. II & III) – Agor, R (Khanna publications, Delhi, 1995)

## Reference Books:

1. Surveying (Vol. II & III) – Arora, K.R. (Standard Book House, Delhi, 1993)
2. Fundamentals of Surveying – S.K. Roy (Prentice Hall of India)
3. Surveying (Vol. I & II) – S.K. Duggal (Tata McGraw Hill)
4. Surveying (Vol. I & II) – Kanetkar T.P. (Pune VidyarthiGrihaPrakashan, Pune)
5. Surveying (Vol. I & II) – C Venkataramaih (Universities Press Hyderabad)

## Course Outcomes:

Students will be able to:

1. Determine elevations by applying different techniques.
2. Deal with the minor instruments and will be familiar with their functioning.
3. Do transverse computations, detect and rectify errors.
4. Set out various curves with the field problems.

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program: **Bachelor of Engineering**

Branch: **Civil Engineering**

Semester: **III**

Subject: **Mechanics of Solids**

Code: **320354(20)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Class Tests: **Two (Minimum)**

Assignments: **Two (Minimum)**

ESE Duration: **Three Hours**

**Maximum Marks: 80 Minimum Marks: 28**

## Course Objectives:

1. To understand the basic concepts of strength of materials which is the base of structural engineering.
2. To know the relation between stress, strain and between different elastic constants.
3. To analyze stresses and strains at any point in a material with various stress conditions.
4. To draw the bending moment and shear force diagram and to find out bending and shear stresses at any point in a cross section of the beam.
5. To analyze column, retaining walls and gravity dams.
6. To understand the concept behind unsymmetrical bending and torsion.

- UNIT-I Stress Strain Relations** - Types of stresses and strains, Mechanicals properties and testing of steel, Hooke's law, Uniaxial tensile test, stress – strain curve, hardness, impact, Poisson's ratio, Modulus of rigidity, Bulk modulus, Relation between the elastic constants, Thermal effects, Elongation of bars of constant and varying sections. Statically indeterminate problems in tension and compression. Thin cylindrical and spherical vessels.
- UNIT-II Analysis of Stresses and Strains** - Body forces, Surface forces, Internal Force, Stress at a point. Components of stress in rectangular coordinates, Principal stresses, Transformation equations, Stress invariants. Plane stresses. Mohr's circle for plane stress, Differential equations of equilibrium. Deformable bodies, Concepts of normal strain and shear strain, Strain components at a point. Transformation equations. Principal strains. Mohr's circle for strains. Compatibility conditions. Displacement equation of equilibrium, Plane strain.
- UNIT-III Bending of Beams** -Theory of simple bending - limitations - bending stresses in beams of different cross sections, beams of uniform strength, beams of two materials, shear stresses in symmetrical elastic beams transmitting both shear and bending moment. Shear force and bending moment diagrams for simply supported overhanging. and cantilever beams and statically determinate plane frames
- UNIT-IV Columns and Combined stresses** -Stable and unstable equilibrium, Short columns, Euler's formula for long columns, Rankin's formula. Beams subjected to bending and shear, Eccentrically loaded short column, Kern of rectangular sections, Middle third rule, stability of gravity dams & retaining walls.
- UNIT-V Unsymmetrical Bending and Torsion** Unsymmetrical bending – Location of neutral axis, Shear flow - shear centre - determination of shear centre for simple sections. Torsion of circular solid and hollow circular shafts - power transmission. Closed coiled and open coiled helical springs.

## Text Books:

1. Strength of Materials – R.K. Rajput (S. Chand & Co.)
2. Mechanics of Materials – B.C. Punmia (Laxmi Publication)

## Reference Books:

1. Mechanics of Structures (Vol. – I) – Junarkar (Charotar Publications)
2. Strength of Materials – Timoshenko, S. & Gere (CBS Publishers)
3. Introductions to Solid Mechanics –Shames & Pitarresi (Prentice Hall of India)
4. Engineering Mechanics of Solid – Popov (Pearson Publication)
5. Strength of Materials – S. Ramamurtham (Dhanpat Rai Publications)
6. Strength of Materials (Part-I) – Timoshenko (CBS Publishers)

## Course Outcome:

1. The basic concepts of Mechanics of Solids are clear to students.
2. By knowing the stresses and strains developed in a structure, the student is able to find out at which point structure is strong and at which point it requires strengthening.
3. The bending moments and shear force at any cross section of the beam can be easily found out with the help of BMD and SFD, which enables the student now to study and design the beam.
4. Knowing the analysis of dams and retaining walls, the stresses at different points of dam and retaining can be known and these structures can be designed.
5. The student is now ready to learn designing of different structures. The base of study of structural analysis and designing is formed, which are the subjects of higher semesters.

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program:	<b>Bachelor of Engineering</b>	Semester:	<b>III</b>
Branch:	<b>Civil Engineering</b>	Code:	<b>320355(20)</b>
Subject:	<b>Building Materials</b>	Total Tutorial Periods:	<b>10</b>
Total Theory Periods:	<b>40</b>	Class Tests:	<b>Two (Minimum)</b>
Class Tests:	<b>Two (Minimum)</b>	ESE Duration:	<b>Three Hours</b>
ESE Duration:	<b>Three Hours</b>	Assignments:	<b>Two (Minimum)</b>
		Maximum Marks:	<b>80</b>
		Minimum Marks:	<b>28</b>

## Course Objectives:

1. To provide an understanding of materials of construction.
2. To provide an understanding of Special concrete.
3. To provide an understanding about timber, plywood, paints and glass materials.

- UNIT-I Cement and aggregates-** Types of Cement, Hydration of cement, tests on properties of cement, ferro cement. Classification of Aggregates (Coarse and Fine) and their properties, tests on aggregates. Classification of Pozzolanas and applications.
- UNIT-II Concrete** - Properties of concrete in fresh and hardened state, water cement ratio, Modulus of elasticity, factors affecting strength of concrete and durability, mixing, transporting, placing, compacting and curing concrete, variables in proportioning concrete mixes, admixtures in concrete, tests on concrete.
- UNIT- III Ceramic Materials-** Introduction to ceramics, types of ceramic products, properties of ceramics, ceramic building products, manufacturing of ceramic products.
- UNIT-IV Timber and Plywood** - Characteristics of good timber, seasoning and preservation, names of timber producing trees and their relative market value. Types and uses of plywood, veneers and hardboards. Low cost materials for construction – System concepts, cost effective materials, industrial wastes, agricultural wastes, methods needed for propagation of new technologies from laboratory to field.
- UNIT-V Paints, Glass etc.** Commercially available varieties of ceramics, glass and their uses, types of tiles, method of manufacturing and tests for suitability. Uses of Plastics and PVC. Composition and use of paints, varnishes and distempers. Composite materials, types and uses.

## Text Books:

1. Building Materials – S.K. Duggal (New Age Publication)
2. Building Materials – S. C. Rangwala (Charotar Publication)
3. Building Materials – M.L. Gambhir, NehaJamwal (Mc. Grawhill)

## Reference Books:

1. Concrete Technology – A.M. Neville & J.J. Brooks (Pearson Education)
2. Concrete Technology – M.S. Shetty (S. Chand & Co.)
3. Engineering Materials – Surendra Singh (Laxmi Publication)
4. Construction Engineering and Management – S. Seetharaman (UmeshPublication)
5. Building Materials – Gurucharan Singh (Standard Publishers, Delhi)

## Course Outcome:

1. Students are expected to understand materials of construction.
2. Students are expected to know about Special concrete.
3. Students are expected to read about timber, plywood, paints and glass materials

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program:	<b>Bachelor of Engineering</b>	Semester:	<b>III</b>
Branch:	<b>Civil Engineering</b>	Code:	<b>320356(20)</b>
Subject:	<b>Engineeirng Geology</b>	Total Tutorial Periods:	<b>10</b>
Total Theory Periods:	<b>40</b>	Assignments:	<b>Two (Minimum)</b>
Class Tests:	<b>Two (Minimum)</b>	<b>Maximum Marks: 80</b>	<b>Minimum Marks: 28</b>
ESE Duration:	<b>Three Hours</b>		

## Course Objectives:

1. To understand fundamental concepts of engineering geology
2. To learn about the various types of rocks and their properties.
3. To study about the Earthquakes, its causes, classification etc
4. To gain knowledge about Landslides, Land subsidence and Geological Hazards
5. To learn about Geological investigations in Civil Engg

- UNIT- I Introduction to Engg. Geology** -To understand fundamental concepts of engineering geology, engineering strength, physical & mechanical properties of minerals, rock forming minerals: A case study.
- UNIT-II Rocks and its formations** -Types of rocks and origins (structure, texture, agents), ternary diagrams, causes of metamorphism, Folds, Faults, Unconformity & joints: a case study.
- UNIT- III Earthquakes** - Earthquake, its causes, classification, seismic zones of India , seismotectanics of the Indian plate, earthquake problem and its preventive measures in construction of building , reservoir , dams , underground railway track & tunnels etc : A case study.
- UNIT-IV Landslides, Land subsidence and Geological Hazards** - Landslides, its causes, classification and preventive measures, land subsidence, its causes and preventive measures, major geological hazards & geological considerations in design of constructed facilities and infrastructure, mitigation of landslide hazard: A case study.
- UNIT-V Geological investigations in Civil Engg** -Geophysical techniques as aids in engineering geological investigations, geological conditions necessary for construction of bridges, dams, tunnels, building, road cuttings, concept of geological maps, important terminology used for map and making a section from the map: A case study

## Text Books:

1. A Textbook of Geology – Mukherjee P.K. (World Press Publishers)
2. Engineering Geology – D.S. Arora (Mohindra Capital Publisher, Chandigarh)

## Reference Books:

1. Geology and Engineering – Leggot, R.F. (Mc-Graw Hill, New York)
2. A Geology for Engineers – Blyth, F.G.M. (Arnold, London)
3. Civil Engineering Geology – Cyril Sankey Fox (C. Lockwood and son, U.K.)
4. Engineering and General Geology – Prabin Singh (Katson Publication House)

## Course Outcomes:

Students will be able to:

1. Show the knowledge about engineering geology.
2. Show knowledge of the most important rocks and minerals and be able to identify them.
3. Analyze the Earthquakes and its various types.
4. Understand the characteristics of various Geological Hazards.
5. Do the Geological investigations; understand the geological conditions and geological maps.

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program: **Bachelor of Engineering**  
Branch: **Civil Engineering**  
Subject: **Fluid Mechanics – I Laboratory**

Total Lab Periods: **48**

Maximum Marks: **40**

Semester: **III**

Code: **320361(20)**

Batch Size: **30**

Minimum Marks: **20**

## List of Experiments: (At least Ten experiments are to be performed by each student)

1. To determine the met centric height of a ship model.
2. Verification of Bernoulli's equation.
3. Verification of momentum equation.
4. To calibrate a venturimeter and study the variation of the coefficient of discharge with the Reynolds number.
5. To calibrate orificemeter and study the variation of the coefficient of discharge with the Reynolds number.
6. Experimental determination of critical velocity in pipe.
7. Determination of head loss coefficient due to sudden expansion in pipe.
8. Determination of head loss coefficient due to sudden contraction in pipe.
9. Determination of head loss coefficient in pipe bends.
10. To determine the hydraulic coefficients ( $C_c$ ,  $C_d$  and  $C_v$ ) of an orifice.
11. To determine the coefficient of discharge of a mouth piece.
12. To calibrate a triangular notch.
13. To calibrate a rectangular notch.
14. To obtain the surface profile and the total distribution of a forced vortex.

## **Equipment/Machines/Instruments/Tools/Software Required:**

- Ship Model
- Bernoulli's Apparatus
- Apparatus for momentum theorem
- Venturimeter
- Orificemeter
- Pipe Flow Apparatus
- Orifice Apparatus
- Mouth Piece Apparatus
- Notch Apparatus
- Vortex Flow Apparatus

## **Recommended Books:**

1. Hydraulics Laboratory Manual – S.K. Likhie (New Age International Ltd.)
2. Fluid Mechanics – Jagdish Lal (Metropolitan Educational, New Delh-2)



# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program: **Bachelor of Engineering**  
Branch: **Civil Engineering**  
Subject: **Surveying Field Work I**  
Total Lab Periods: **48**  
Maximum Marks: **40**

Semester: **III**  
Code: **320362(20)**  
Batch Size: **30**  
Minimum Marks: **20**

## List of Experiments: (At least Ten experiments are to be performed by each student)

1. To determine the elevation of a point with respect to reference elevation by Fly Leveling
2. To determine sensitivity of bubble tube of a dumpy level.
3. Contouring and its plotting.
4. Measurement of horizontal angle by repetition method.
5. Measurement of horizontal angle by reiteration method.
6. To determine the height of object when base is accessible.
7. To determine the height of tower when base is inaccessible and instrument stations are in same vertical plane.
8. To find out the position of points by the Plane Table Radiation and Intersection method.
9. Determination of location of a point with the help of Two point problem.
10. Determination of location of a point with the help of Three point problem.
11. Setting out of curve by ordinates or offsets from long chord.
12. Setting out of curve by successive bisection of arcs.
13. Setting out of curve by offsets from chords produced .
14. Setting out of curve by two theodolite method.
15. Setting out of curve by Rankine's method.

## **Equipment/Machines/Instruments/Tools/Software Required:**

- Metric Chain (30 m)
- Tape (15m, 30 m)
- Ranging Rod (2 m, 3m)
- Plumb bob
- Arrows
- Theodolite
- Leveling Staff (Folding and Non-folding)
- Wooden Pegs
- Plain Table Accessories (Drawing Board – 70 x 60 x 1.5 cm, Spirit Level, Trough Compass, Tripod Stand, Alidade, Plumb bob for centering)
- Offset Rod
- Optical Square
- Cross Staff

## **Recommended Books:**

1. Surveying (Vol. I & II) – Punmia, B.C. (Laxmi Publications, New Delhi, 1996)
2. Surveying (Vol. I & II) - C Venkataramaih (Universities Press Hyderabad)
3. Surveying (Vol. I & II) – Kanetkar T.P. (Pune VidyarthiGrihaPrakashan, Pune)

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program: **Bachelor of Engineering**  
Branch: **Civil Engineering**  
Subject: **Material Testing Laboratory**

Total Lab Periods: **48**  
Maximum Marks: **40**

Semester: **III**  
Code: **320363(20)**  
Batch Size: **30**  
Minimum Marks: **20**

## List of Experiments: (At least Ten experiments are to be performed by each student)

1. Determination of Compressive strength of cement.
2. Determination of Tensile strength of cement.
3. Determination of Fineness of cement by sieving method.
4. Determination of Fineness of cement by Blain Apparatus.
5. Determination of Soundness of cement.
6. Determination of Specific gravity of cement.
7. To determine Uniaxial Tensile Test of mild steel.
8. To determine IzodCharpy Value of given mild steel.
9. To determine the Rockwell Hardness of given Material.
10. To determine Compressive Strength of Wood: (a) Along the fibre and (b) Across the fibre.
11. Determination of Specific gravity and water absorption of aggregate.
12. Abrasion Test on tiles.
13. Impact test on tiles.
14. Flexural Strength of Tiles.
15. To study the Cupping Test Machine and determine Erichser value of mild steel sheet.

## **Equipment/Machines/Instruments/Tools/Software Required:**

- Cube mould 7.06 cm size
- IS Sieve 80, 40, 20, 10, 4.75, 2.36, 1.18 mm and 600, 300, 150, 90 Micron
- Sieve Shakers
- Tensile Strength Testing Machine
- Oven Wire Basket
- Spring Balance and Weighing Balance
- Air permeability blain apparatus
- Abrasion Testing Machine
- Flexural Strength Testing Machine for tiles
- Universal Testing Machine
- Hardness Testing Machine
- Impact Testing Machine

## **Recommended Books:**

1. Lab Manual Concrete Lab – M.L. Gambhir (Tata McGraw Hill)
2. Concrete Technology – M.S. Shetty (S. Chand & Co.)

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**  
Branch: **Civil Engineering**  
Subject: **Engineering Geology Laboratory**  
Total Lab Periods: **48**  
Maximum Marks: **40**

Semester: **III**  
Code: **320364(20)**  
Batch Size: **30**  
Minimum Marks: **20**

## List of Experiments: (At least Ten experiments are to be performed by each student)

1. Identification of granite, pegmatite, syenite megascopic observations.
2. Identification of basalt, gabbro, charnokite, dolerite.
3. Identification of limestone, sand - stone, shale.
4. Identification of conglomerate, breccias, clay.
5. Identification of slate, phyllite, marble.
6. Identification of quartzite, schist, gneiss.
7. A study on simple geological maps
8. To Draw a cross section, filling of geological data there in.
9. To make a sketch of faults, with identification of folds, faults and unconformity.
10. A case Study of structural folds, faults and unconformity.
11. A study of Talc, gypsum, calcite, fluorite apatite.
12. A study of feldspar, quartz, topaz, corundum.
13. A study of hornblende, garnet, tourmaline asbestos, olivine,.
14. A study of serpentine, barite, muscovite, biotite, arpmint, realgar, sulphur, amethyst & varieties of uartz, zeolite
15. A study of Hematite, magnetite, pyrite, chalespyrite, pyrolusite, psilomelane, beryl, magnesite, bauxite, zincite, galena etc.

## **Equipment/Machines/Instruments/Tools/Software Required:**

- Crystallographic Model
- Wooden Cabinet
- Axis of symmetrical of 6 System
- Planes of symmetrical of 6 System
- Crystallographic Axis & Centre of System
- Mohr Scale of Hardness
- Streak Plates
- Hardness Testing Knife
- Model Showing Strike, Dip, Pitch
- Symmetrical Anticline Showing Axis-Axial Plane
- Asymmetrical Anticline Showing Axis-Axial Plane
- Isoclinal Anticline & Syncline
- Recumbent Fold
- Fan Fold
- Step Fault
- Rock Specimen
- Wooden Specimen Tray
- Polarizing Petrological Microscope
- Mineral Specimens

## **Recommended Books:**

1. Geology and Engineering – Leggot, R.F. (Mc-Graw Hill, New York)
2. Engineering and General Geology – Prabin Singh (Katson Publication House)

# Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program: **Bachelor of Engineering**

Branch: **Civil Engineering**

Semester: **III**

Subject: **Value Education**

Code: **320365(46)**

No. Of Periods: **2 Periods/Week**

Total Tutorial Periods: **NIL**

**Maximum Marks: 40**

**Minimum Marks: 24**

## Course Objectives:

1. This course is designed to provide the importance of education with why, what & how.
2. To impart students with an understanding of fundamental humanitarian viewpoint and its outcomes.
3. To provide the knowledge about whole existence and its impact on values.
4. To bring the awareness about life long exercise so that they can fulfill their responsibility towards themselves, the family, the society, the planet.

**UNIT-I Aim of Education and Necessity for Value Education:** Education in values/wisdom/etc and education in traits/technologies/etc as the two fundamental strands of education; Answer to the frequently asked questions such as “Why to do studies”, “What studies to do in overall”, “How to do studies in a proper way”, “How to think systematically and talk systematically”

**UNIT-II Humanitarian Viewpoint and Basic Human Objective:** Meaning and concept of happiness, Need for a fundamental viewpoint to judge things in all cases of human concerns, Proposal of the natural path of humanitarian coexistentialism; Consciousness development and its expression; Fundamental want of sustainable happiness in human being; Understanding the distinct activities and needs of self (I) and body in human being; Fundamental goal of human being; Sustainable-solution in individual (At the place of delusion); Sustainable-prosperity in family (At the place of poverty); Sustainable-cooperation in society (At the place of competition); Sustainable-coexistence in planet (At the place of struggle)

**UNIT-III Elements of Holistic and Systematic Perspective:** Need for study of fundamental information categories to develop holistic perspective; Particular-time actions and general-time laws; Need for fundamental information sequence to develop systematic perspective, Some examples for systematic study sequence

**UNIT-IV Elements of Society-friendly and Environment-friendly Goals:** Elements of Knowledge of whole existence; Elements of Knowledge of human being; Elements of fundamental Values and Wisdom; Value spectrum with reference to general relationships and particular relationships of the objects in nature; Elements of History and Contemporarity used to set current goals; Elements of Sciences and Techniques to formulate methods to achieve goals; Elements of Motoricity and Mattericity to make actions to execute the methods

**UNIT-V Lifelong Exercise for All-round Sustainability:** Collecting information for sustainability issues; Motivating people towards sustainable life-style; Ability to identify and develop appropriate technologies and management patterns for society-friendly and environment-friendly systems for production /protection/ utilization/ experimentation ; Ability to establish and execute the fundamental five-fold system in order to ensure sustainable peace-and-prosperity worldwide.

## Text Books:

Value Education for Consciousness Development by Dr P B Deshmukh, Radha K Iyer, and Deepak K Kaushik (2<sup>nd</sup> Edition, 2012, ISBN: 978-81-924034-0-3)

## Reference Books:

1. International Research Handbook on Values Education and Student Wellbeing by Terence Lovat, Ron Toomey, Neville Clement (Eds.), Springer 2010, ISBN: 978-90481-86747
2. Values Education and Lifelong Learning: Principles, Policies, Programmes by David N Aspin and Judith D Chapman (Eds.); Springer 2007, ISBN: 978-1-4020-6183-7
3. Fundamentals of Ethics for Scientists and Engineers by E G Seebaur and Robert L Berry, 2000, Oxford University Press