RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH- CIVIL ENGINEERING

(CHOICE BASED CREDIT SYSTEM)

Sem: III (3rd)	Total Hours Distribution per week	
Total Credit : 4	Lecture (L): 3 Hrs	Tutorial/Activity (T/A): 1 Hr.
Subject Code	BTCVE301T	APPLIED MATHEMATICS-III
Examination Scheme			
Internal Marks:	University Marks:	Minimum Passing Marks:	Examination Duration:
30 Marks (15marks for sessional Examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hours

Course Objectives	
1	The aim is to introduce and develop the advanced Mathematical Skills of Engineering students that are imperative for effective understanding of Civil Engineering subjects.
2	The topics covered will equip them with the techniques to understand advanced level Mathematics and its applications that would enrichlogical thinking power.

Course Outcomes	
After completion of syllabus, students would be able to	
1	Apply Fourier series in the analysis of periodic functions not in terms sine and cosine encountered in engineering problems
2	Solve Partial differential equations of first, higher and second order using elementary techniques; formulate mathematical models to simple problems of vibration of strings and beams in terms of Partial differential equations and solving with elementary solution techniques.
3	Learn the concept of finding maxima and minima of definite integral involving unknown function and its derivatives.

4	Learn Eigen value problem and its applications.
5	Learn to find an approximate solution of algebraic and transcendental equations, system of linear equations and first order ordinary differential equations by various Numerical Methods
6	Formulate simple optimization problem and learn to solve it by Graphical method and Simplex method.

MAPPING OF CO WITH PO

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1												
2												
3												
4												
5												

1 Low　　　　**2 Medium**　　　　**3 High**

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
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(CHOICE BASED CREDIT SYSTEM)

BTCVE301T - APPLIED MATHEMATICS-III

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
UNIT NO.1 (FOURIER SERIES)			
Periodic functions and their Fourier expansions, Even and Odd functions, Half range expansion.	5	1	1
UNIT NO.2 (PARTIAL DIFFERENTIAL EQUATIONS)			
Partial Differential Equations of first order first degree i.e. Lagrange's form, Linear Homogeneous Equations of higher order with constant coefficients. Method of separations of variables, Applications to simple problems of vibration of strings and beams.	10	1	2
UNIT NO.3 (CALCULUS OF VARIATIONS)			
Maxima and minima of functional, Euler's equation, Functionals dependent on First & Second orders derivatives.	5	1	3

UNIT NO.4 (MATRICES)			
Linear dependence of vectors, Characteristics equations, Eigen values and Eigen vectors. Reduction to diagonal form, Sylvester's theorem, Quadratic form, Association of matrices with linear differential equation of second order with constant coefficients.	8	1	4
UNIT NO.5 (NUMERICAL METHODS)			
Solution of Algebraic and Transcendental Equation: Bisection method, False position method, Newton –Raphson method Solution of system of simultaneous linear equations: Gauss elimination method, Gauss Seidel method, Crouts method. Numerical solution of ordinary differential equation :Taylor's series method, Picard's method, Runge- Kutta 4th order method, Euler modified method and Milne's Predictor- Corrector method.	12	1	5
UNIT NO.6(INTRODUCTION TO OPTIMIZATION TECHNIQUES)			
Linear programming problem: Formulation, Graphical method, Simplex method.	8	1	6

References

Name of Book	Name of Author	Name of Publisher	Edition
Higher Engineering Mathematics	B.S. Grewal	Khanna Publication	40th
Advanced Engineering Mathematics	Erwin Kreysizig	Wiley India	8th
Applied Mathematics for Engineers & Physicist	L.R. Pipes and Harville		
Calculus of variation	Forrey		
A Text Book of applied Mathematics, Volume I & II	P.N. Wartikar& J.N. Wartikar	Poona Vidyarthi Griha Prakashan	
Introductory methods of Numerical Analysis	S.S. Sastry	PHI	
Mathematics for Engineers	Chandrika Prasad		
A text book of Engineering Mathematics	N. P. Bali & M. Goyal	Laxmi Publication	

(Dr. A.N. Dabhade)
BOS Member

(Dr. Avinash N Shrikhande,)
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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH CIVIL ENGINEERING

(CHOICE BASED CREDIT SYSTEM)

Sem: III (3ʳᵈ)	Total Hours Distribution per week		
Total Credit:3	Lecture (L): 3 Hrs	Tutorial/Activity (T/A): NA	Practical (P): 1 Hr.
Subject Code	BTCVE302T	FLUID MECHANICS	
Examination Scheme			
Internal Marks:	University Marks:	Minimum Passing Marks:	Examination Duration:
30 Marks (15marks for sessional Examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hours

Course Objectives	
1	To impart the importance and practical significance of various fluid properties
2	To discuss and evaluate various forces acting on partially and fully submerged bodies
3	To discuss and evaluate the importance of various parameters on the fluid motion.
4	To discuss various flow measuring devices with their practical applications
5	To deliberate the concept of impulse momentum principle, dimensional analysis and model analysis of a fluid phenomenon

Course Outcomes	
After completion of syllabus, students would be able to	
1	Understand the importance and practical significance of various fluid properties
2	Comprehend and estimate various forces acting on partially and fully submerged bodies
3	Evaluate the importance of various parameters on the fluid motion.
4	Know various flow measuring devices with their practical applications
5	Illustrate the concept of impulse momentum principle, dimensional analysis and model analysis of a fluid phenomenon

MAPPING OF CO WITH PO

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Subject Code &CO NO.												
CO1	3	3										
CO2	3	3	1									
CO3	3	3	2									
CO4	3	3	1									
CO5	3	3	2	1								

1 Low   2 Medium   3 High

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,
NAGPUR FACULTY OF SCIENCE & TECHNOLOGY
B.TECH - CIVIL ENGINEERING

(CHOICE BASED CREDIT SYSTEM)

BTCVE302T - FLUID MECHANICS

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	**T/A**	**CO**
UNIT NO.1 (INTRODUCTION)			
1. **Fluid Mechanics and its importance** in Civil Engineering, Rheological diagram and itssignificance. 2. **Fluid Properties**: Basic Properties, Viscosity and its Significance, Surface Tension, Capillarity, Compressibility, Vapour Pressure. 3. **Pressure and its measurement**: Pressure at a point and its representation, atmospheric and gauge pressure, Pressure measurement by manometer, information about mechanical and digitalpressure gauges.			
UNIT NO.2			
1.**Hydrostatics**: Total Pressure and centre of pressureon for a plane surface and curved surface immersed in fluid. Numerical Problems. 2. **Stability of Floating Bodies**: Archimedes Principle, Metacentre and centre of buoyancy, Metacentric height and its determination, Stability of floating bodies partially submerged and fully submerged. 3. **Fluid masses** subjected to relative equilibrium, effect of horizontal and vertical acceleration on the moving fluid masses.			
UNIT NO.3			
1. **Kinematics of Flow:**Euler and Lagrangian approaches, velocity and acceleration of fluid, local and convective acceleration, Continuity equation, Stream function and velocity potential functions, Streamline, Path line and streak lines. 2. **Kinetics of Flow:**Forces acting on a fluid mass, Euler's Equation of motion, Bernoulli's Equation.			

UNIT NO. 4			
Flow measuring Devices:			
(a) For pipeline- Venturimeter, orifice meter, Nozzle meter, Pitot Tube for velocity measurement			
(b) For tank- Orifice and its types, hydraulic coefficients, mouth piece and its types.			
(c) ForOpen Channel- Notches and weirs, velocity of approach, End contraction, Sharp crested,broad crested weir and Labriynth weir			

UNIT NO. 5			
1. **Impulse momentum principle** and its application, impact of jet, concept of velocity triangle.			
2. **Dimensional Analysis**, Dimensionally Homogenous equation, Methods of Dimensional Analysis, Dimensionless numbers			
3. **Model Analysis**: Types of similarities, Reynold's and Froude's model law, Distorted and Undistorted model.			

References

Name of Book	Name of Author	Name of Publisher	Edition
Hydraulics, Fluid Mechanics and Hydraulic Machines	P.N. Modi& S.M. Seth	Standard Book House, Delhi	21st (2017)
A Text Book of Fluid Mechanics and Hydraulic Machines	R.K. Bansal	Laxmi Publications (P) Ltd., New Delhi	9th (2005)
A Text Book of Fluid Mechanics and Hydraulic Machines	R.K. Rajput	S Chand & Company (P) Ltd., New Delhi	6th (2015)
Fluid Mechanics including Hydraulic Machines	A.K. Jain	Khanna Publishers	(2006)
Hydraulics, Fluid Mechanics and Fluid Machines	S. Ramamrutham	DhanpatRai Publishing Co., New Delhi	9th (2011)

(Dr. Avinash N Shrikhande,)
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BoS member

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B.TECH - CIVIL ENGINEERING
(CHOICE BASED CREDIT SYSTEM)

Sem: III(3rd)	Total Hours Distribution per week	
Total Credit :1	**Practical (P): 2 Hrs.**	
Subject Code	**BTCVE302P**	**FLUID MECHANICS**
Examination Scheme - Practical			
Internal Marks:	**University Marks:**	**MinimumPassing Marks:**	**Examination Duration:**
25 Marks	**25 Marks**	**25 Marks**	--

List of Experiments:

1. Determination of Metacentric height and its importance.
2. Calibration of Venturimeter and its practical utility
3. Calibration of Orifice meter and its practical utility
4. Calibration of Rectangular Notches/ V-Notches.
5. Calibration of Rectangular Notches/ V-Notches
6. Hydraulic Coefficients of an orifice.
7. Hydraulic Coefficients of a Mouthpiece.
8. Verification of Bernoulli's Theorem
9. Impact of jet apparatus

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B. TECH - CIVIL ENGINEERING
(CHOICE BASED CREDIT SYSTEM)

Sem: III (3rd)	Total Hours Distribution per week		
Total Credit : 4	Lecture (L): 3 Hrs		Tutorial/Activity (T/A): 1 Hr.
Subject Code	BTCVE303T	SOLID MECHANICS	
Examination Scheme			
Internal Marks:	University Marks:	Minimum Passing Marks:	Examination Duration:
30 Marks (15marks for sessional Examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hours

Course Objectives	
1	To determine the Mechanical behavior of the body by determining the stresses, strains produced by the application of load and to apply the fundamentals of simple stresses and strains.
2	To determine the Shear Force and Bending Moment at a section for different condition.
3	To facilitate the concept of bending and its theoretical analysis in a beam To determine the Bending and shear stress in a given beam.
4	To develop slope and Deflection equations for beams subjected to various loads.
5	To determine the torsion in circular section, Direct and Bending Stresses

Course Outcomes	
After completion of syllabus, students would be able to	
1	Understand the behaviour of materials under different stress and strain conditions.
2	Evaluate and draw shear force diagram and bending moment diagram and their relation.
3	Formulate the bending and shear stresses equations and able to draw bending and shear stress diagrams.
4	Formulate slope and Deflection equations for beams subjected to various loads by Macauleys method
5	Analyze and Evaluate the torsion in circular section, Direct and Bending Stresses

MAPPING OF CO WITH PO

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	3	3	3						1		3
2	3	3	3	3						1		3
3	3	3	3	3						1		3
4	3	3	3	3	1					1		3
5	3	3	3	3	1					1		3

1 Low   2 Medium   3 High

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(CHOICE BASED CREDIT SYSTEM)
BTCVE303T - SOLID MECHANICS

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
UNIT NO.1 (STRESS AND STRAIN)			
Concept of stress and strain, Stress-Strain diagrams and their Characteristics for mild steel and TOR Steel.	2	1	1
Stresses and strains in simple, composite bars in uniaxial tension and compression,	3	1	
Temperature stresses in simple restrained bars, composite bar.	2	1	
Elastic Constants and Relation between them. Introduction to Biaxial And triaxial loading.	1	1	
UNIT NO.2 (SHEAR FORCE AND BENDING MOMENT)			
Types of Beams. Shear Force and Bending Moment	1	1	2
Relation between Bending Moment and Shear Force	1	1	
Bending Moment Diagram and Shear Force Diagrams	5	1	
UNIT NO.3 (STRESSES IN BEAMS)			
Bending Stresses in Beams, Assumptions and derivation of simple bending theory	2	1	3
relation between bending moment, bending stress and curvature of homogeneous and composite beams,	2	1	
Shear stresses in simple beams, Shear flow and shear stress distribution,	2	1	
shear stress in composite beams, combined effect of bending moment and axial force.	2	1	
Principal stresses, maximum shear stresses	2	1	

UNIT NO.4 (DEFLECTION OF BEAMS)			
Differential equations of the deflection curve. Bending of uniformly loaded beams.	1	1	
Deflection of simply supported beam loaded by a concentrated load.	2	1	
Introduction to Macauleys method. Deflection of a simply supported and cantilever beam by the Macauleys method.	2	1	4
Method of superposition. The deflection of beams with overhangs.	2	1	
UNIT NO.5 (TORSION, DIRECT AND BENDING STRESSES)			
Direct and Bending Stresses	2	1	
Torsion of circular section, assumptions and derivation of relations Between torsional moments, shear stress and angle of twist.	3	1	5
Torsion in thin walled hollow section closely coiled helical springs.	2	1	

References

Name of Book	Name of Author	Name of Publisher	Edition
Strength of Materials	S. Ramamrutham	Dhanpat Rai	
Strength of Materials	Dr. R K Bansal	Laxmi Publication	5th
Strength of Materials	S.P. Timoshenko	Mc. Graw Hill	
Mechanics of Materials	Ferdinand P.Beer, E. Russell Johnston Jr.	Mc. Graw Hill	
Strength Of Materials	F.L. Singer	Haper and Row	
Schaum's outline of Strength of Materials	William A. Nash	Mc. Graw Hill	
Applied Mechanics and Strength of Materials	A. B. Clemens	International text book company 1906	

(Dr. Avinash N Shrikhande,)
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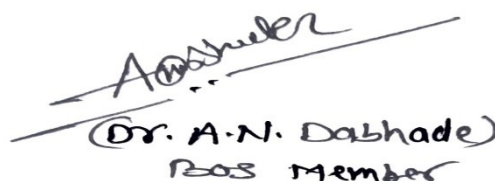
(Dr. A·N· Dabhade)
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RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B. TECH - CIVIL ENGINEERING
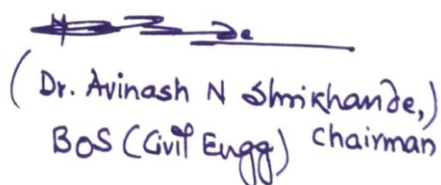## (CHOICE BASED CREDIT SYSTEM)

Sem: III (3rd)	Total Hours Distribution per week		
Total Credit : 1	Practical (P): 2 Hrs.		
Subject Code	**BTCVE303P**	**SOLID MECHANICS**	
Examination Scheme - Practical			
Internal Marks:	University Marks:	Minimum Passing Marks:	Examination Duration:
25 Marks	25 Marks	25 Marks	--

List of Experiments: (Any Six)

1. To Study Various Types of Strain Gauge Apparatus
2. To Determine The Tensile Strength of Steel Specimen
3. To Perform Hardness Test on Various Metals.(Brinnell Hardness Test &Dynamic Hardness Test.)
4. To Perform Standard Torsion Test on Metals
5. To Perform The Impact Test on Metal (Izod/ Charpy)
6. To Determine The Spring Constant of Closely Coiled Spring .
7. To Perform Shear Test on Different Metals
8. To Perform Fatigue Test on Mild Steel Bar.
9. To Perform Bending Test on Wooden Beam And Find Its Flexural Rigidity

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B. TECH CIVIL ENGINEERING
(CHOICE BASED CREDIT SYSTEM)

Sem: III (3rd)	Total Hours Distribution per week		
Total Credit: 3	**Lecture (L): 3 Hrs**	**Tutorial/Activity (T/A): NA**	**Practical (P): 2 Hrs.**
Subject Code	**BTCVE304T**	**GEOTECHNICAL ENGINEERING**	
Examination Scheme			
Internal Marks:	**University Marks:**	**Minimum Passing Marks:**	**Examination Duration:**
30 Marks **(15marks for sessional Examination)** **(15 Marks for** **Activity based)**	**70 Marks**	**45 Marks**	**3 Hours**

Course Objectives	
1	To impart knowledge about index properties and their determination.
2	Introduce to the students, the principle permeability and seepage in the soil.
3	To impart knowledge about engineering properties and their determination.
4	Familiarize the students with the procedures used for Shallow and Deep foundation.
5	To impart knowledge about Basic Geology.

Course Outcomes	
After completion of syllabus, students would be able to	
1	Find the index and engineering properties of the soil.
2	Determine properties & demonstrate interaction between water and soil.
3	Analyze and compute principles of compaction and consolidation settlements of soil.
4	Ability to analyze to calculate bearing capacity, earth pressure and foundation settlement.
5	Study and identify different type's natural materials like rocks & minerals and soil.

MAPPING OF CO WITH PO

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	2	2	1	--	--	2	2
CO2	3	2	1	2	--	--	2	1	--	1	--	2
CO3	3	2	2	2	1	2	--	1	--	2	--	2
CO4	3	2	1	1	1	2	2	1	--	2	--	2
CO5	3	2	2	2	2	--	--	1	--	--	2	2

1 Low   2 Medium   3 High

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(CHOICE BASED CREDIT SYSTEM)
BTCVE304T- GEOTECHNICAL ENGINEERING
SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
UNIT NO.1 (INTRODUCTION AND PHASES OF SOIL)			
Formation of soil, residual & transported soil, major deposits found in India.	1		1
Soils generally used in practice such as sand, gravel, organic soil, clay, Betonies, black cotton soil etc.	1		1
Various soil weight & volume inter-relationship.	1		1
Index Properties & Their Determination, Water content, specific gravity, sieve analysis, particle size distribution curve, sedimentation analysis.	2		1
Consistency of soil, Atterberge's limits.	2		1
Classification of Soil: Particle size classification, Textual classification, Unified & I.S. classification system.	2		1
UNIT NO.2 (PERMEABILITY, SEEPAGE & STRESS DISTRIBUTION)			
Darcy's law & its validity, Discharge & seepage velocity, factors affecting permeability.	1		2
Determination of coefficients of permeability by Laboratory and field methods.	1		2
Permeability of stratified soil. insitu permeability test.	1		2
Seepage pressure, quick sand condition, characteristics & uses of	1		2

flownets.			
Preliminary problems of discharge estimation in homogeneous soils, Effective, Neutral and total stresses in soil mass. Piping, filter criteria.	1		2
UNIT NO.3 (CONSOLIDATION & COMPACTION)			
Compression of laterally confined soil, Terzaghis 1-D consolidation theory (formation of Differential equation).	1		3
Determination of coefficient of consolidation, Degree of consolidation.	1		3
Determination of preconsolidation pressure, Settlement, Rate of settlement.	1		3
Compaction: Mechanism of compaction, factors affecting compaction.	1		3
Standard & modified proctor Tests, field compaction equipments, quality control.	1		3
Advance compaction Techniques, Nuclear density meter.	1		3
Shear Strength: Introduction, Mohr Coulomb's theory, Drainage condition.	1		3
Measurement of shear strength by direct shear test, triaxial test, unconfined compression test.	1		3
Vane shear test, sensitivity. Shear strength of clays and sands.	1		3
UNIT NO.4(SHALLOW & DEEP FOUNDATION)			
Bearing capacity of soil: Factor affecting bearing capacity, Terzaghis theory.	1		4
Its validity and limitation, types of shear failure in foundation soil.	1		4
Effect of water table on bearing capacity, Settlement of shallow foundation.	1		4
Classification of piles, constructional features of cast- in – situ & pre cast concrete piles.	1		4
Pile driving methods, effect of pile driving on ground.	1		4
Pile capacity by static formula & dynamic formulae spacing of piles in group, negative skin friction and its effect on pile capacity.	1		4

UNIT NO.5 (PHYSICAL GEOLOGY)			
Introduction and scope of Geology and subdivision ,Internal structure of the earth, Weathering, erosion and denudations process on earth material and natural agencies	1		5
Geological work of wind, river underground water and glaciers.	1		5
Earthquakes: Basics of earthquake, earthquake history, seismic activity, concept of intensity and magnitude of earthquake, causes of earthquake	1		5
Influence on civil structures and engineering consideration, seismic zonation, Stratigraphy of INDIA-Introduction.	1		5

References							
Applicable for Unit No.	Name of Book	Name of Author	Name of Publisher	Edit ion	Category		
					Text Book	Research paper	Reference book
1,2,3,4,5,	Soil Mechanics & Foundation Engg	B.C.Punmia	Laxmi Publication		Yes		
1,2,3,4,	Soil Mechanics & Foundation Engg	K.R. Arora	Std. Publisher		Yes		
1,2,3,4,	Soil Mechanics & Foundation Engg	Modi	Std. Publisher				Yes
1,2,3,4,	Soil Mechanics & Foundation Engg	V.N.S.Murthy	CBS Publisher				Yes
5	Geology for Engineers		FGH Blyth		Yes		
5	Basic Geotechnical Earthquake Engineering	Kamalesh Kumar			Yes		

List of Code/Handbook

Applicable for Unit No.	Title of Code	Type of code	Year of Publication
2,5	Geotechnical Handbook by B.M.Das		2011
2	Methods of test for soils, IS : 2720 (Part VII-1980)	Indian Standard	AUGUST 1997
3	Methods of test for soils, Laboratory determination of Permeability, IS 2720-PART-17-1986).	Indian Standard	Reaffirmed 2002
2	I.S. 2720 (Part-29) : 1975 (Reaffirmed 1988) core cutter method. I.S. 2720 (Part 28) : 1974 (Reaffirmed 1988) Sand replacement method.	Indian Standard	Reaffirmed 1995
4	Methods of test for soils, Direct shear test, I.S. 2720 (Part-XIII) 1965.	Indian Standard	Reaffirmed 2002
5	Methods of test for soils, Proctor Test, I.S. 2720 (Part-VIII) – 1965	Indian Standard	SEPTEMBER 1994

Applicable for Unit No.	Website address
1	https://www.geoengineer.org/education/soil-mechanics
1	http://civilengineering-notes.weebly.com
2	https://www.geoengineer.org/education/soil-mechanics
2	https://nptel.ac.in
3	https://www.slideshare.net/prasadprabhu50/chapter-3-compaction-and-consolidation
4	https://nptel.ac.in/content/storage2/courses/105101083/download/lec17.pdf
4	https://www.slideshare.net/jagrutib22/all-about-deep-foundations
5	https://sites.google.com/site/3rdsemnotes/engineering-geology

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(CHOICE BASED CREDIT SYSTEM)

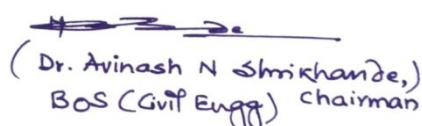| Sem: III (3rd)	Total Hours Distribution per week	
Total Credit : 1	Practical (P): 2 Hrs.	
Subject Code	**BTCVE304P**	**GEOTECHNICAL ENGINEERING**
Examination Scheme - Practical			
Internal Marks:	University Marks:	MinimumPassing Marks:	Examination Duration:
25 Marks	25 Marks	25 Marks	--

List of Experiments :

A. Any 10

1. Moisture content and Specific gravity of soil.

2. Grain size Analysis – (Sieve Analysis).

3. Consistency limit, plastic limit and liquid limit of soil.

4. Hydrometer Analysis.

5. Constant Head Permeability test of or Falling Head Permeability test.

6. Consistency limit of soil (shrinkage limit).

7. Field Density by sand replacement method.

8. Field Density by core cutter method.

9. Unconfined compression test.

10. Direct shear Test.

11. Triaxial shear test (Demonstration).

12. Study of Plate load Test.

13. Proctors compaction Test and Proctor needle test.

B. One field visit or one case study included in journal.

C. Use of plasticity Chart or Newmarks Chart.

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(CHOICE BASED CREDIT SYSTEM)

Sem: III (3rd)	Total Hours Distribution per week		
Total Credit: 2	**Lecture (L): 3Hrs**	**Tutorial/Activity (T/A): NA**	**Practical (P): 1 Hr.**
Subject Code	**BTCVE305T**	**BUILDING CONSTRUCTION & ELEMENTARY BUILDING DRAWING**	
Examination Scheme			
Internal Marks:	**University Marks:**	**Minimum Passing Marks:**	**Examination Duration:**
30 Marks **(15marks for sessional Examination)** **(15 Marks for Activity based)**	**70 Marks**	**45 Marks**	**3 Hours**

	Course Objectives	
1	To prepare the students to understand components of buildings and their functions.	
2	To prepare students to understand execution of various constructions activities and material.	
3	To prepare students to analyse behaviour of structure under different environmental conditions.	
4	To prepare students to identify & suggest rectification the various defects in civil engineering works.	

	Course Outcomes	
After completion of syllabus, students would be able to		
1	Identify components of a building.	
2	Differentiate and identify types of building materials.	
3.	Select appropriate material for building construction.	
4.	Plan various construction related activities and their quality control.	
5.	Know & identify the latest techniques and materials used.	

MAPPING OF CO WITH PO

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Subject Code & CO NO.												
1	3											2
2		2			1							3
3					3							
4				3								
5		2										3

1 Low   2 Medium   3 High

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,
NAGPUR FACULTY OF SCIENCE & TECHNOLOGY
B. TECH - CIVIL ENGINEERING
(CHOICE BASED CREDIT SYSTEM)
BTCVE305T - BUILDING CONSTRUCTION &
ELEMENTARY BUILDING DRAWING

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
UNIT NO.1 (FOUNDATIONS)			
Foundations: Necessity and types of R.C.C. foundations, Detail of Deep foundation and precast foundation in general, Details shallow foundations.	3		4
Bearing capacity of soils and its assessment. Preumptive bearing capacity values from codes. Loads on foundations. Causes of failures of foundations and remedial measures,	2		4
Foundation on black cotton soils Setting out foundation trenches, excavation timbering of foundation trenches. Load bearing and framed structures.	2		4
	7		
UNIT NO.2 (BRICKWORK AND STONE WORK)			
Qualities of good bricks, classification of bricks, Terms used in brickwork, commonly used types of bonds in brickwork such as header, stretcher, English and Flemish bonds, principles of construction. Reinforced brickwork.	2		2
Parapets, copings, sills and corbels, brief introduction to cavity walls, load bearing and partition walls. Masonry construction using cement concrete blocks and clay blocks, load bearing and partition walls. Precast construction: Introduction to method and materials. Precast elements likes poles, cover, jellies, steps corbels, truss element etc.	2		3
Selection of stones types of stone masonry, principles of construction	2		2

Joints in masonry. Lifting heavy stones, common building stones in India.			
Arches and Lintels: Terminology in contraction, types chajjas and canopies, pre cast Lintels & Arches.	2		3
	8		

UNIT NO.3 (DPC, FLOORS AND ROOFS)

Damp Proofing: Causes and effect of dampness. Various methods of damp proofing Damp proofing in plinth protection, New Techniques of Damp Proofing Damp Proofing in Plinth Protection, New Techniques of Damp proofing. Epoxy etc.	3		3
Floors: General principals, types and method of construction, floors finished quality, testing floor tiles, synthetic & Ceramic Tiles.	2		1
Roofs: Flat and pitches roofs, roof coverings, types AND their constructional features. Thermal Insulation	2		5
	7		

UNIT NO.4 (STAIRS, DOORS AND WINDOWS)

Stairs: Types of stairs, functional design of stairs.	3		4
Doors and Windows: Purpose materials of construction and types.	4		4
	7		

UNIT NO.5 (PLASTERING AND POINTING, PAINTING)

Plastering and Pointing : Necessity, types and methods	2		2
Temporary Timbering: Centering and formwork shoring, underpinning and scaffolding.	3		2
Painting: White washing, colour washing and distempering new materials & Techniques.	2		2
	7		

References							
Applicable for Unit No.	**Name of Book**	**Name of Author**	**Name of Publisher**	**Edition**	**Category**		
					Text Book	**Research paper**	**Reference book**
1 to 5	Building Construction	by Rangwala	Charotar Pub. House				yes
1 to 5	Building	G. S.	Dhanpat		yes		

	Construction & Construction Materials	Birde & T. D. Ahuja	Rai Pub. company				
1 to 5	Building Construction	Arun kr. Jain Ashok kr. Jain B. C. Punmia	Laxmi	11th			yes
1 to 5	Building Construction	Gurucharan singh	Standard Book House		yes		

(Dr. Avinash N Shrikhande,)
BOS (Civil Engg) chairman

(Dr. A.N. Dabhade)
BOS Member

Sem: III (3rd)	Total Hours Distribution per week	
Total Credit : 1	**Practical (P): 2 Hrs.**	
Subject Code	**BTCVE305P**	**BUILDING CONSTRUCTION & ELEMENTARY BUILDING DRAWING**
Examination Scheme - Practical			
Internal Marks:	**University Marks:**	**Minimum Passing Marks:**	**Examination Duration:**
25 Marks	**25 Marks**	**25 Marks**	**--**

List of Experiments:

1. Development of a given line plan of a residential building.
    Draw to a scale of 1: 50
    1. Detailed Plan.
    2. Elevation.
    3. Section.

2. Following Sketches pertaining to the above plan (with Standard Dimensions)
    a. Door- Panelled door
    b. Window
    c. Stair
    d. Masonry
    e. Lintel

3. Students should prepare working drawing of Foundation Plan (on tracing paper) for the above Residential Building Plan. It should contain detailed foundation plan with foundation details. (Use suitable scale 1:50 or 1:100)

4. Draw sketches using computer software of the following:
    1. Foundations- two plates
    a) Line sketches of shallow and deep footing.
    b) Details of any one of the shallow footings.
    2. Arches- two plates.
    a) Different types of arches
    b) Details of arch showing different components
    3. Trusses- one plate. (Showing different components)

5. One seminar report and presentation based on various aspects of Modern materials and construction methods.

6. Site visit and technical report on the visit (Minimum Two).
(Visit should contain Stage of visit, related sketches of components-C/S-Dimensions, Materials used, site plan sketch and detailed report etc.) Visit to a construction related exhibition is strongly recommended.

7. Collection of advertisements of modern construction materials and Tools used in construction.

8. Indoor dimension: Height of kitchen platform, bathroom fittings positioning details, furniture details etc.

Note: Collection of local byelaws details from the surrounding areas, Building plan according to byelaws. Carrying a 5m tape is compulsory to all.

List of Code/Handbook			
Applicable for Unit No.	Title of Code	Type of code	Year of Publication
1 to 5	Building Construction Handbook by R. Chudley, Roger Greeno		Jun 2021
1 to 5	Building Construction Handbook by Sanjeev Mathur		Jun 2021
1 to 5	Practical Handbook on Building Construction by Er. M. K. Gupta		2019
1 to 5	National Building Code of India		Jan 2014
1 to 5	IS-4031, 650, 383, 2387,		

Aster G. Shende

(Dr. A.N. Dabhade)
BoS Member

(Dr. Avinash N Shrikhande,)
BoS (Civil Engg) Chairman

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH CIVIL ENGINEERING
(CHOICE BASED CREDIT SYSTEM)

Sem: III (3rd)	Total Hours Distribution per week		
Total Credit: 2	**Lecture (L): 2Hrs**	**Tutorial/Activity (T/A): N.A**	**Practical (P): N.A**
Subject Code	**BTCVE306T**	**EFFECTIVE TECHNICAL COMMUNICATION**	
Examination Scheme			
Internal Marks:	**University Marks:**	**Minimum Passing Marks:**	**Examination Duration:**
15 Marks (07 marks for sessional Examination) (08 Marks for Activity based)	**35 Marks**	**23 Marks**	**2 Hours**

Course Objectives	
1	To enhance competency in English language among learners aspiring to be entrepreneurs.

Course Outcomes	
After completion of syllabus, students would be able to	
1	Participate effectively in groups with emphasis on listening and meta cognitive thinking.
2	Prepare memorandum and report.
3.	Deliver an effective oral presentation.
4.	Acquire public speaking skills handling the audience professionally.
5.	Analyze causes of deterioration of concrete components

MAPPING OF CO WITH PO

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1												
2												
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1 Low   2 Medium   3 High

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
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(CHOICE BASED CREDIT SYSTEM)
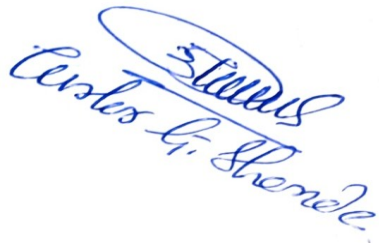# BTCVE306T- EFFECTIVE TECHNICAL COMMUNICATION
SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
UNIT NO.1 Functional Grammar			
Common errors, Transformation of Sentences, Phrases, Idioms & Proverbs. [50 sentences of common errors, 50 examples of Transformation of Sentences, (5 each type), 50 noun/prepositional phrases, 50 idioms/proverbs]	6		
UNIT NO.2 English for Competitive Exams & Interview Techniques			
IPA (vowel & consonant phonemes), Word building (**English** words /phrases derived from other languages), Technical Jargons, Synonyms/Antonyms, Analogies, Give one word for, Types & Techniques of Interview Assignment : [25 Words for teaching IPA, 25 words/phrases of foreign origin, 25 technical jargons, 25 words for Synonyms/ Antonyms, 25 words for Analogies, 50 examples of give one word for]	6		
UNIT NO.3 Formal Correspondence			
Business Letters, e-mail etiquettes [Orders, Complaints , Enquiries, Job applications and ResumeWriting ,Writing Memorandum, Circulars, notices]	6		
UNIT NO.4 Analytical comprehension	4		
Four fictional & four non-fictional unseen texts			
UNIT NO.5 Technical & Scientific Writing			
Features of Technical Writing, Writing Scientific Projects, Technical Report writing, Writing Manuals, Writing Project	6		

Proposals, Writing Research papers. Assignment: (Any one project/review as assignment)			
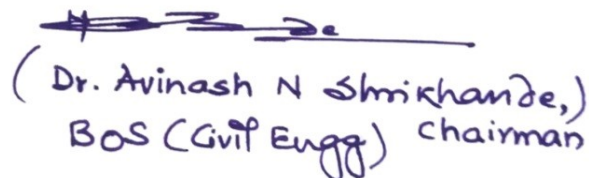
Reference Books:

1. Effective technical Communication by Barun K. Mitra, Oxford University Press,
2. Technical Communication-Principles and Practice by Meenakshi Raman & Sharma, Oxford UniversityPress, 2011, ISBN-13-978-0-19-806529-
3. The Cambridge Encyclopedia of the English Language by David Crystal , Cambridge University Press
4. Contemporary Business Communication by Scot Ober , Published by Biztantra,
5. BCOM- A South-Asian Perspective by C.Lehman, D. DuFrene & M. Sinha, Cenage Learning Pvt.Ltd.2012
6. Business English, by Dept of English, University of Delhi, Published by Dorling Kindersley (India), Pvt .Ltd.,2009, ISBN 978 81 317 2077 6

7. How to Prepare a Research Proposal: Guidelines for Funding and Dissertations in the Social andBehavioral Sciences by Krathwohl & R David
8. Technical Writing- Process and Product by Sharon J. Gerson & Steven M. Gerson, 3rd edition, PearsonEducation Asia, 2000
9. Developing Communication skills by Krishna Mohan & Meera Banerjee

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