



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IIIrd	Total Hours Distribution per week		
Total credit:4	Lecture (L):3hrs	Tutorial/Activity (T/A): 1Hrs	Practical (P):Hrs
Subject Code	BTCVE301T	Name of Subject: Applied Mathematics -III	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
15 Marks (07 marks for sessional Examination) (08 Marks for Activity based)	70 Marks	45 Marks	3 Hours

Syllabus

Unit No.1 (FOURIER SERIES)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Periodic functions and their Fourier expansions, Even and Odd functions, Half range expansion.	5	1	1
Unit No.2 (PARTIAL DIFFERENTIAL EQUATIONS)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Partial Differential Equations of first order first degree i.e. Lagrange's form, Linear Homogeneous Equations of higher order with constant	10	1	2



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

coefficients. Method of separations of variables, Applications to simple problems of vibration of strings and beams.

Unit No.3 (CALCULUS OF VARIATIONS)

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Maxima and minima of functional, Euler's equation, Functionals dependent on First & Second orders derivatives.	5	1	3

Unit No.4 (MATRICES)

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
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)

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
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 Milnes Predictor- Corrector method. ,	12	1	5



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Unit No.5 (INTRODUCTION TO OPTIMIZATION TECHNIQUES)

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Linear programming problem: Formulation, Graphical method, Simplex method.	8	1	6

Name of book	Name of Author	Name of Publisher	Edition
Higher Engineering Mathematics	B.S. Grewal	Khanna Publication	40TH
Advanced Engineering Mathematics	Erwin Kreyszig	Wiley India	8TH
Applied Mathematics for Engineers & Physicist	L.R. Pipes and Harville	S Chand & Company (P) Ltd., New Delhi	
Calculus of variation	Forrey	Khanna Publishers	
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		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IIIrd	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):1Hrs
Subject Code	BTCVE302T	Name of Subject: FLUID MECHANICS	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 (INTRODUCTION)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
1. Fluid Mechanics and its importance in Civil Engineering, Rheological diagram and its significance. 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,			01



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

information about mechanical and digital pressure gauges.

Unit No.2

Detail of Topic

Allotment of Hours		Mapped with CO Number
L	T/A	CO

1. Hydrostatics: Total Pressure and centre of pressure on 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.

2

Unit No.3

Detail of Topic

Allotment of Hours		Mapped with CO Number
L	T/A	CO

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.

3

Unit No.4

Detail of Topic

Allotment of Hours		Mapped with CO Number
L	T/A	CO

Flow measuring Devices: (a) For pipeline- Venturimeter, orifice meter, Nozzle meter, Pitot Tube for velocity measurement



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

(b) For tank- Orifice and its types, hydraulic coefficients, mouth piece and its types.
 (c) For Open Channel- Notches and weirs, velocity of approach, End contraction, Sharp crested, broad crested weir and Labrynth weir

4

Unit No.5

Detail of Topic

Allotment of Hours

Mapped with CO Number

L

T/A

CO

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.

5

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	9 th (2005)
A Text Book of Fluid Mechanics and Hydraulic Machines	R.K. Rajput	S Chand & Company (P) Ltd., New Delhi	6 th (2015)
Fluid Mechanics including Hydraulic Machines	A.K. Jain	Khanna Publishers	(2006)
Hydraulics, Fluid Mechanics and Fluid Machines	S. Ramamrutham	Dhanpat Rai Publishing Co., New Delhi	9 th (2011)



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IIIrd	Total Hours Distribution per week		
Total credit:4	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):1Hrs
Subject Code	BTCVE303T	Name of Subject: SOLID MECHANICS	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 (STRESS AND STRAIN)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Concept of stress and strain, Stress-Strain diagrams and their Characteristics for mild steel and TOR Steel	2	1	01
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)			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
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)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
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)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Differential equations of the deflection curve. Bending of uniformly loaded beams.	1	1	4
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	
Method of superposition. The deflection of beams with overhangs.	2	1	
Unit No.5 (TORSION, DIRECT AND BENDING STRESSES)			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Direct and Bending Stresses	2	1	5
Torsion of circular section, assumptions and derivation of relations Between torsional moments, shear stress and angle of twist.	3	1	
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 Publications (P) Ltd., New Delhi	5 th
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	



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IIIrd	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):2Hrs
Subject Code	BTCVE304T	Name of Subject: GEOTECHNICAL ENGINEERING	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 (INTRODUCTION AND PHASES OF SOIL)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Formation of soil, residual & transported soil, major deposits found in India	1		01
Soils generally used in practice such as sand, gravel, organic soil, clay, Betonies, black cotton soil etc	1		
Various soil weight & volume inter-relationship.	1		
Index Properties & Their Determination, Water content, specific gravity, sieve analysis, particle size distribution curve, sedimentation analysis.	2		
Consistency of soil, Atterberge's limits.	2		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Classification of Soil: Particle size classification, Textual classification, Unified & I.S. classification system	2		
Unit No.2 (PERMEABILITY, SEEPAGE & STRESS DISTRIBUTION)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Darcy's law & its validity, Discharge & seepage velocity, factors affecting permeability	2	1	2
Determination of coefficients of permeability by Laboratory and field methods.	2	1	
Permeability of stratified soil. insitu permeability test.	2	1	
Seepage pressure, quick sand condition, characteristics & uses of flownets.	2	1	
Preliminary problems of discharge estimation in homogeneous soils, Effective, Neutral and total stresses in soil mass. Piping, filter criteria.	2	1	
Unit No.3 (CONSOLIDATION & COMPACTION)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
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		
Determination of preconsolidation pressure, Settlement, Rate of settlement	1		
Compaction: Mechanism of compaction, factors affecting compaction.	1		
Standard & modified proctor Tests, field compaction equipments, quality control.	1		
Advance compaction Techniques, Nuclear density meter	1		
Shear Strength: Introduction, Mohr Coulomb's theory, Drainage condition.	1		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Measurement of shear strength by direct shear test, triaxial test, unconfined compression test.	1		
Vane shear test, sensitivity. Shear strength of clays and sands.	1		
Unit No.4 (SHALLOW & DEEP FOUNDATION)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Bearing capacity of soil: Factor affecting bearing capacity, Terzaghis theory.	1		4
Its validity and limitation, types of shear failure in foundation soil.	1		
Effect of water table on bearing capacity, Settlement of shallow foundation.	1		
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		
Pile capacity by static formula & dynamic formulae spacing of piles in group, negative skin friction and its effect on pile capacity.	1		
Unit No.5 (PHYSICAL GEOLOGY)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
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		
Earthquakes: Basics of earthquake, earthquake history, seismic activity, concept of intensity and magnitude of earthquake, causes of earthquake	1		
Influence on civil structures and engineering consideration, seismic zonation, Stratigraphy of INDIA-Introduction.			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Applicable for unit No.	References					Category		
	Name of book	Name of Author	Name of Publisher	Edition		Text Book	Reserch Paper	Referen ce 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	Yes					yes
1,2,3,4,	Soil Mechanics & Foundation Engg	V.N.S.Murt hy	CBS Publisher					
5	Geology for Engineers	FGH Blyth				yes		
5	Basic Geotechnical Earthquake Engineering	Kamalesh Kumar				Yes		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IIIrd	Total Hours Distribution per week		
Total credit:2	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):1Hrs
Subject Code	BTCVE305T	Name of Subject: BUILDING CONSTRUCTION & ELEMENTARY BUILDING DRAWING	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 (FOUNDATIONS)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Foundations: Necessity and types of R.C.C. foundations, Detail of Deep foundation and precast foundation in general, Details shallow foundations	3		01
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		
Foundation on black cotton soils Setting out foundation trenches, excavation timbering of foundation trenches. Load bearing and framed structures.	2		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	7		
Unit No.2 (BRICKWORK AND STONE WORK)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
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		
Selection of stones types of stone masonry, principles of construction Joints in masonry. Lifting heavy stones, common building stones in India	2		
Arches and Lintels: Terminology in contraction, types chajjas and canopies, pre cast Lintels & Arches	2		
	08		
Unit No.3 (DPC, FLOORS AND ROOFS)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
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		
Floors: General principals, types and method of construction, floors finished quality, testing floor tiles, synthetic & Ceramic Tiles.	2		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

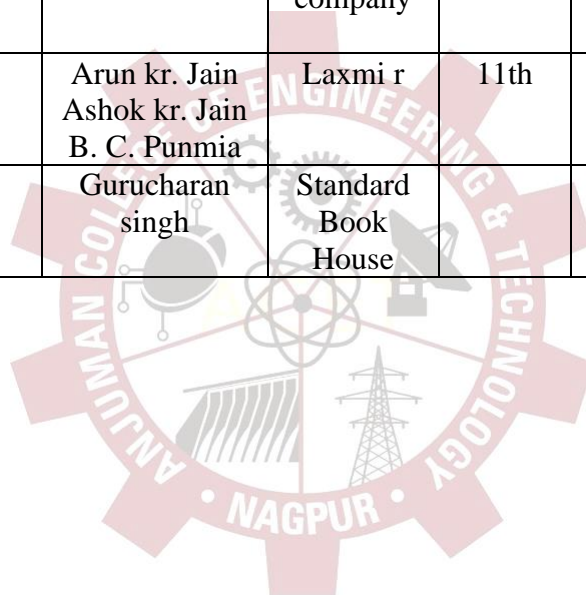
Roofs: Flat and pitches roofs, roof coverings, types AND their constructional features. Thermal Insulation	2		3
	07		
Unit No.4 (STAIRS, DOORS AND WINDOWS)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Stairs: Types of stairs, functional design of stairs.	3		4
Doors and Windows: Purpose materials of construction and types.	4		
	07		
Unit No.5 (PLASTERING AND POINTING, PAINTING)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Plastering and Pointing : Necessity, types and methods	2		5
Temporary Timbering: Centering and formwork shoring, underpinning and scaffolding.	3		
Painting: White washing, colour washing and distemping new materials & Techniques.	3		
	07		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Applicable for unit No.	References						
	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
1 to 5	Building Construction	by Rangwala	Charotar Pub. House				Yes
1 to 5	Building Construction & Construction Materials	G. S. Birde & T. D. Ahuja	Dhanpat Rai Pub. company		Yes		
1 to 5	Building Construction	Arun kr. Jain Ashok kr. Jain B. C. Punmia	Laxmi r	11th			yes
1 to 5	Building Construction	Gurucharan singh	Standard Book House		yes		





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IIIrd	Total Hours Distribution per week		
Total credit:2	Lecture (L):2hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):Hrs
Subject Code	BTCVE306T	Name of Subject :EFFECTIVE TECHNICAL COMMUNICATION	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
15 Marks (07 marks for sessional Examination) (08 Marks for Activity based)	35 Marks	23 Marks	2 Hours

Syllabus

Unit No.1 Functional Grammar			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
(4 hours) 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 phrase, 50 idioms/proverbs]	6		
Unit No.2 English for Competitive Exams & Interview Techniques			
Detail of Topic	Allotment of Hours		Mapped with CO Number



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	L	T/A	CO
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		2
Unit No.3 Formal Correspondence			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Business Letters, e-mail etiquettes [Orders, Complaints , Enquiries, Job applications and ResumeWriting ,Writing Memorandum, Circulars, notices]	6		3
Unit No.4 Analytical comprehension			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Four fictional & four non-fictional unseen texts.	4		4
Unit No.5 Technical & Scientific Writing			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Features of Technical Writing, Writing Scientific Projects, Technical Report writing, Writing Manuals,Writing Project Proposals, Writing Research papers. Assignment: (Any one project/review as assignment)	6		5

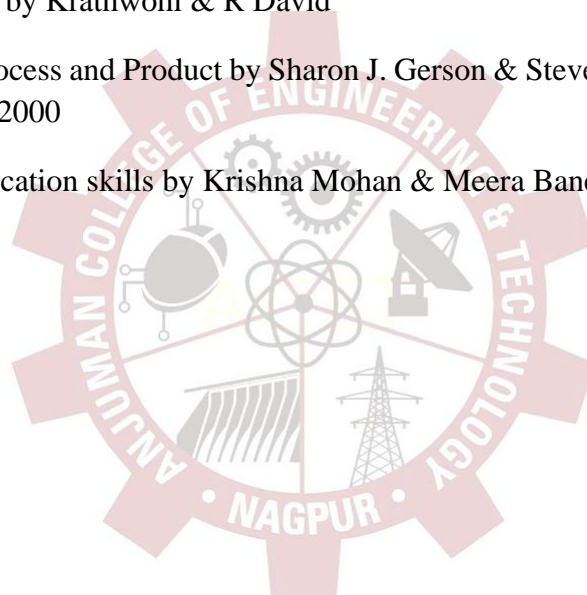


ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Reference Books:

1. Effective technical Communication by Barun K. Mitra, Oxford University Press,
2. Technical Communication-Principles and Practice by Meenakshi Raman & Sharma, Oxford University Press, 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 and Behavioral Sciences by Krathwohl & R David
8. Technical Writing- Process and Product by Sharon J. Gerson & Steven M. Gerson, 3 rd edition, PearsonEducation Asia, 2000
9. Developing Communication skills by Krishna Mohan & Meera Banerjee





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IV	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE401T	Name of Subject:	CONCRETE TECHNOLOGY
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

UNIT NO.1(BASICS AND CONSTITUENTS OF CONCRETE)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Historical background, composition of concrete, general note on strength mechanism, recent practice and future trends	01		01
Constituent of Concrete : Cement - Chemical composition, hydration, heat of hydration, hydrated structure, various types of cement, grades of cement, testing of cement as per Indian standard.	02		
Aggregates - Utility in concrete, classification, effect of geometry & texture, strength, mechanical properties, moisture content, water absorption,	02		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

bulking of sand, deleterious substances, sieve analysis, various grading and grading requirements			
Water - General Requirements & limiting values of impurities	01		
Admixtures - Additives and admixtures, types, necessity and benefit Mineral admixture - Fly ash, silica fume, blast furnace slag, and other pozzolanic materials. Chemical admixtures - Accelerator, retarder, water reducing elements, plasticizer and super-plasticizer, their functions and dosage	02		
	08		

UNIT NO.2(FRESH AND HARDENED CONCRETE)

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
General: Methods of batching and mixing. Workability –factors affecting workability, measurement tests on workability(Slump cone test, Compaction factor test, Vee-bee consistometer test, flow table test), transporting and placing of concrete, curing of concrete, W/c ratio, Segregation and bleeding, Maturity of Concrete.	03		2
Compressive and tensile strength test, flexural strength and their relationship, factors affecting strength of concrete.	02		
Introduction to aspects of elasticity, shrinkage and creep. Factors affecting shrinkage and creep, non-destructive tests with their limitations	02		
Radiative forcing Effects on plants and animals instruments used for quantification	07		

UNIT NO.3(MIX DESIGN)

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Principles of mix proportioning, probabilistic parameters, factors governing selection of mix.	02		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Methods of Concrete Mix Design: Variability of test results, acceptance criteria, Road note 4 method(DOE), ACI and IS method of concrete mix design and fly ash based mix Design.	05			3
	07			
UNIT NO.4 (SPECIAL CONCRETE)				
Detail of Topic	Allotment of Hours		Mapped with CO Number	
	L	T/A	CO	
Review of behaviour and characteristics of high strength concrete, high performance concrete, self-compacting Concrete, fibre reinforced concrete, light weight and heavy weight concrete,.	04			4
Pumped concrete, underwater concrete, hot and cold weather concreting, Ready mixed concrete.	03			
	07			
UNIT NO.5 (REPAIR AND REHABILITATION OF CONCRETE STRUCTURE)				
Detail of Topic	Allotment of Hours		Mapped with CO Number	
	L	T/A	CO	
Distress in structure – causes and precautions, damage assessment of structural elements, repairing techniques and repairing materials.	03			5
Cracks in concrete: Causes, types, prevention, repairs of cracks – materials and methods.	04			
	07			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
1&2	Concrete Technology	M S Shetty;	S.Chand Publication New Delhi		Text Book		
3	Concrete Technology	P Kumar Mehta,	Indian Concrete Institute		Text Book		
4&5	Properties of Concrete	A.M.Neville	Pearson Education		Text Book		
3	Concrete Technology	M L Gambhir;	Tata McGraw Hill		Text Book		
3	Concrete mix design for flyash and superplastici zer	Kishore kaushal	ICI bulletin	Apr - june 1997		Research paper	



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IV	Total Hours Distribution per week		
Total credit:4	Lecture (L):3hrs	Tutorial/Activity (T/A): 1Hrs	Practical (P):0Hrs
Subject Code	BTCVE402T	Name of Subject: STRUCTURAL ANALYSIS	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

UNIT NO.1 (STATICALLY INDETERMINATE STRUCTURES)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction to Statically indeterminate Structures : Concept of Static indeterminacy.	02	1	01
Analysis of Fixed and Continuous Beams by Three Moments Theorem, effects of Sinking of Support.	06	1	
UNIT NO.2 (ANALYSIS OF BEAMS AND FRAMES)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Analysis of Continuous Beams & Portal frames by Slope Deflection Method ..	04	1	2
Analysis of Continuous Beams & Simple Portal frames (sway and Non Sway) Using Moment Distribution Method.	04	1	

UNIT NO.3 (INFLUENCE LINE DIAGRAM)

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Rolling loads on simply supported beams with concentrated and uniformly distributed loads, maximum B.M. and S.F. Influence Line Diagrams for Reactions, Shear Forces and Bending Moments in simply supported beam, cantilevers and beams with overhangs, ILD for forces in members of Simple Trusses.	06	1	3

UNIT NO.4(MATRIX STIFFNESS METHOD –APPLICATION TO BEAMS AND PLANE FRAMES)

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Basic concept, Degree of Freedom, Direct Stiffness Method. Formulation of elemental/local stiffness matrix and global stiffness matrix for beam members (without axial deformation), for plane frame members. Member load matrix due to concentrated loads, uniformly distributed loads. Transformation matrix, Assembly of global/structural load matrix upto three elements. Solution to problems with maximum degree of freedom three.	04	1	4

UNIT NO.5 (STIFFNESS METHOD – APPLICATION TO PLANE TRUSS)

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Formulation of elemental/local stiffness matrix and global stiffness matrix for plane truss.	07		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Transformation matrix, Assembly of global/ Structural stiffness matrix upto(8 x 8). Assembly of global / structural load matrix. Solution to problems with maximum degree of freedom three.

5

References							
Appli cable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
	Theory of Structures	S Ramamurtham R. Narayan	DhanpatRai& Sons	V edition			
	Structural Analysis	L S Negi& R S Jangid	Tata McGraw Hill	I			
	Matrix Analysis of Framed Structures	W Weaver & Gere	CBS publisher	III edition			
	Theory of Structure	S P Timoshenko	Mc. Graw Hill				
	intermediate Structural Analysis	C.K Wang	Mc. Graw Hill				
	Structural Analysis	C.S Reddy	Mc. Graw Hill				
	Structural Analysis	R.C. Hibbler					



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IV	Total Hours Distribution per week		
Total credit:4	Lecture (L):3hrs	Tutorial/Activity (T/A): N/AHrs	Practical (P):0Hrs
Subject Code	BTCVE403T	Name of Subject: ENVIRONMENTAL ENGINEERING	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

UNIT NO.1	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction: Basics of water supply scheme, Water Demand, population forecasting methods, Sources of water & intake structures.	02		01
Conveyance of water: Types of pipes, joints, fittings, valves & 1 appurtenances.	02		
Water quality: characteristics of water, Standards of drinking water. (WHO 2011, CPHEOO, IS 10500-2016).	02		
Water Treatment: Objective of water treatment, flow sheet of conventional water treatment plant.	01		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Sedimentation: Principles, types of setting basins, inlet and outlet arrangements, simple design of sedimentation tank.	02		
UNIT NO.2			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Coagulation and Flocculation: Definition, Principles, types of coagulants, coagulant doses, types of mixing and flocculation devices, Clariflocculators.	03		2
Filtration: Mechanism of filtration Types of filters- RSF, SSF, Pressure filters, sand specification, operational problems.Simple design of SSF and RSF, Membrane filtration technique of water treatment..	03		
Disinfection: Purpose, Mechanism, disinfectants, disinfection by chlorination. Type of chlorination.	02		
Distribution systems: Requirements & methods of distribution systems with layouts	01		
UNIT NO.3			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
General Introduction: Study of waste water, black water & grey water. System of collection and conveyance of sewage- separate and combined systems, patterns of sewage collection systems. Quantity of storm water and sanitary waste water, Problems on quantity estimation.	03		3
Sewer: Types, Shapes, Hydraulic Design (Capacity, Size, Grade, etc.), Construction of sewer - Shoring, Trenching and laying to grade. Sewer materials, Sewer Appurtenances - manhole street inlets, storm water overflows, inverted syphons, flushing and ventilation: House plumbing systems, sanitary fitting and appliances, traps, anti-syphonage, inspection chambers and intercepting	03		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

traps. Sewage pumping - location of pumping station. Sewer testing and maintenance.			
Characteristics: Physical and chemical characteristics of wastewater, significance of BOD, COD, BOD rate constant (Problems)	02		
UNIT NO.4			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Preliminary & Primary Treatments: Sewage treatment flow sheet, site selection for sewage treatment plant. Preliminary and primary treatments - Screens, Grit chambers, oil & grease removal, Primary settling tank (Only working principles)	03		4
Secondary treatments - Principle of Biological Treatment, bacterial growth curve, Activated sludge process, trickling filter, sequence batch reactors, oxidation ponds (Only working principles)	02		
Sewage Disposals: Indian Standard for disposal, Methods of disposal, Sewage farming, self-purification of stream (Streeter Phelp's equation, Oxygen sag curve). Recycle & reuse of sewage (Zero discharge concept). Sludge digestion process, sludge drying beds.	02		
Rural sanitation: Pit privy, aqua privy, bio-gas recovery, Septic tank- soak pit (Only working principles). Sullage collection and disposal	02		
UNIT NO.5			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction of air pollution and municipal solid waste, climate change, geo environment, environmental management system and sustainable resource management.	03		5



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
	Water Supply Engineering	B.C.Punmia, Ashok Jain and Arun Jain	Laxmi Publication				
	Water Supply & Sewage	M.J.Macghee	McGraw Hill				
	Environmental Engineering Vol – I (Water Supply Engineering) and Environmental Engg Vol. II.	Dr P.N. Modi.	Standard Book House				
	Environmental Engineering	Howards Peavy, Donald R. Rowe and George Tchobanoglous.	Mc. Graw Hill				
	Central Public Health Environmental Engg. Manual		(CPHEEO) New Delh				
	Environmental Engineering-Vol II	S.K.Garg	Standard Publication				
	Waste Water Engineering	B.C.Punmia, Ashok Jain and Arun Jain	Laxmi Publication				
	Water Supply & Sanitary Engineering	G.S.Birdie	DhanpatRai Publication				



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IV	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): N/AHrs	Practical (P):0Hrs
Subject Code	BTCVE404T	Name of Subject: TRANSPORTATION ENGINEERING	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

UNIT NO.1			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction Transportation Technologies, Components of Transportation Systems, Transportation Coordination, Transportation Administrative Set-up in India	02		01
Highway development: 1 Rural Road Development Plan and Vision 2025, Highway Organizations (MoRTH, IRC, CRRI, NHAI, NRRDA, CIRT)	03		
Highway Alignment: Ideal Alignment, Factors controlling alignment, Fact finding survey, Engineering survey for highway location.	03		
UNIT NO.2			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Highway Geometric Design: Cross-Section elements (Boundary lines, right-of way, carriageway width, Shoulder, Camber), surface characteristics, Sight distance Considerations (SSD, OSD,ISD), Design of horizontal Curves including transition, extra widening, Design of vertical curves.	05		2
Pavement Design: Types of Pavements and their comparison, Factors affecting design, Design of Flexible pavement using latest IRC code. Stresses in rigid pavement, joints, Pavement Distresses and remedies	03		
UNIT NO.3			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Traffic Engineering: Traffic characteristics (Road User and Vehicular), Traffic Studies (Speed Volume, O&D, Parking), Traffic Control Devices (Sign, Marking, Signal), Types of Intersections, Parking facilities, Road safety situation in India, Causes of road accidents, Safety of Vulnerable Road users, Introduction to road safety audit Introduction to ITS.	08		03
UNIT NO.4			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Railway Engineering: Permanent Way, ideal permanent way, Gauges in railway tracks,function of rail, sleeper ballast. Traction and resistances. Cant , negative cant & cant deficiency, Types of turnouts & functions of its components	08		4
UNIT NO.5			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Airport Engineering: Aircraft Characteristics, Airport site selection, Runway Orientation, Basic Runway length and corrections, Terminal Area and facilities. Aircraft parking, configuration and system, Aprons, Hangers, Gate in airport[8].	08		5

References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Referenc e book
	Highway Engineering	Khanna, S.K., Justo, C.E.G and Veeraragavan, A	Nem Chand & Bros	10th (2017)			
	Traffic Engineering and Transport Planning	Kadiyalai, L.R	Khanna Publishers				
	Principles of Transportation Engineering	ParthaChakraborty and Animesh Das	PHI Learning				
	Textbook of Highway Engineering	Srinivasa Kumar	Universities Press	2011			
	Highway Engineering	Paul H. Wright and Karen K. Dixon	Wiley Student Edition	7 th (2009)			
	Principles of Highway Engineering and Traffic Analysis	Fred L. Mannering, Scott S. Washburn, Walter P. Kilareski	John Wiley 3, IRC Codes	4TH			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:IV	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): N/AHrs	Practical (P):4Hrs
Subject Code	BTCVE405T	Name of Subject: SURVEYING AND GEOMATICS	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

UNIT NO.1 (LINEAR AND ANGULAR MEASUREMENT)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Principal of Surveying, Classification,	01		01
measurement of distance using tape, EDM (Distomat), error and correction in length	02		
Measurement of area by tape and cross-staff and plane table surveying	02		
Compass Surveying-Prismatic Compass & Surveyor compass, Bearings, Local attraction, Fieldwork & Plotting	03		
UNIT NO.2 (THEODOLITE TRAVERSING AND CURVES)			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Uses of theodolite, measurement of horizontal and vertical angle.	02		2
measurement of horizontal and vertical distances(stadia methods)	02		
errors and corrections in traverse	02		
Introduction to simple circular curves, Transition curves, vertical curves and Reverse Curve	02		
UNIT NO.3 (LEVELING AND CONTOURING)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Levelling , types of levelling, Auto level, temporary adjustments,	01		03
calculation of Reduced level by rise and fall & H.I. method	02		
correction for curvature and refraction , visible horizon distance	01		
Contours: Definition, characteristics, uses, locating and plotting of contour map.	02		
Computation of area and volume: Trapezoidal and Simpsons Rule	02		
UNIT NO.4(MODERN SURVEYING)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Total station-advantages and Applications.	01		4
Field Procedure for total station survey,	01		
Errors in Total Station Survey and preparation of Contours and site plan in CAD	02		
Introduction to GPS and DGPS (Differential Global Positioning System) Principle and	04		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Applications for Static and Real Time Kinematic (RTK) Survey			
UNIT NO.5 (REMOTE SENSING AND GIS)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction to Remote Sensing and Geographical Information System (GIS) and its applications	04		5
Introduction to UAV Drone and LiDAR Survey and applications.	04		5

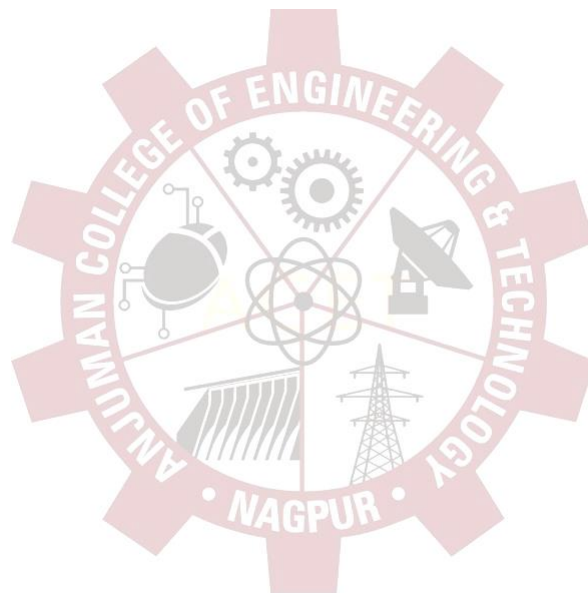
References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
I, II, III	Surveying and Levelling	Kanetkar and Kulkarni	VidhatigrihanPrakashan	2008			
I, II, II, I, IV	Surveying (Vol-I)	Dr. B.C. Punmia, A.K.Jain	Laxmi Publications (P)Ltd.	2016	Y		
III	Surveying (Vol-II)	Dr. B.C. Punmia, A.K.Jain	Laxmi Publications (P)Ltd.	2016	Y		
I, II, II, I, IV	Surveying and Levelling	N.N.Basak	Tata McGraw-Hill education (P) Ltd	2001	Y		
IV, V	Advance Surveying, Total Station, GIS and Remote Sensing	SatheeshGopi & R.Sathikumar & N.Madhu	Pearson Education	2008	Y		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:V	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE501T	Name of Subject: Hydraulics Engineering	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Real Fluid Flow:			
Viscous Flow: Reynold's experiment, viscous flow through a circular pipe, velocity and shear stress distribution, Hazen poisuillee equation	02		01
Boundary layer concept: Nominal thickness, displacement thickness, momentum thickness of the boundary layer: Boundary layer along a thin plate and its characteristics; Laminar boundary layer; turbulent boundary layer; laminar sub-layer: separation of boundary layer on plane and curved surfaces	03		
Real, Incompressible Fluid Flow Around Immersed Bodies: General definition of drag and lift; flow past plates, cylinders and spheres; drag on sphere; drag on sphere, cylinder and flat plate	03		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	08		
Unit No.2			
Flow through Pipes:	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Hydraulically smooth and rough pipes: Frictional resistance to flow of fluid in smooth and rough pipes; Moody's chart; Darcy-Weisbach & Hazen-William's equation for frictional head loss; Hydraulic gradient and energy gradient: Pipes in series and parallel; Branched pipes; Siphon; transmission of power through pipes; Hardy-Cross methods of pipe networks; Water-hammer, pressure head due to sudden closure of valve	07		2
	07		
Unit No.3			
Uniform Flow Through Open Channels	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
(A) General: Types of channel and their geometrical properties; Types of flow in open channel.	03		03
(B) Uniform Flow: Chezy's and Manning's equations; Hydraulically most efficient rectangular, triangular and trapezoidal sections; Computations of normal depth of flow, conveyance of channel, section factor for uniform flow, normal slope and normal discharge.	03		03
(C) Critical Flow: Specific energy and its diagram; alternate depths; Computations of critical depth, section factor for critical flow, critical slope; normal, critical slope, Specific force and its diagram; Conditions of critical flow.	02		03
Unit No.4			
Non Uniform Flow through Open Channel	Allotment of Hours		Mapped with CO Number



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	L	T/A	CO
(A) Gradually Varied Flow: Dynamic equation for GVF; Classification and characteristics of surface profiles; direct Step method of computing profile length.	02		04
(B) Rapidly Varied Flow: Definition of hydraulic jump; Equation of hydraulic jump in horizontal, rectangular channel; Length & height of jump; Energy loss in jump classifications of jump	03		
Concept of Impact of Jet			
Force exerted on stationary and moving plate and curved surface, concept of velocity triangles	02		
	07		
Unit No.5			
Fluid Machinery	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
(A) Turbines: Definition: Gross and net heads; different efficiencies; Classification of turbines; component parts and working principles; selection of turbines on the basis of head and specific speed.	02		05
(B) Reciprocating Pumps: Components parts, working principle, Work done of single & double acting pumps; Negative slip, Air vessels-Working principle and necessity, indicator diagram	02		
(C) Centrifugal Pump: Component parts; working principle; Static and manometric heads; different efficiencies; Priming & priming devices, Specific speed; Theoretical aspects of multistage pumps; Trouble & remedies; operating characteristics curves.	03		
	07		

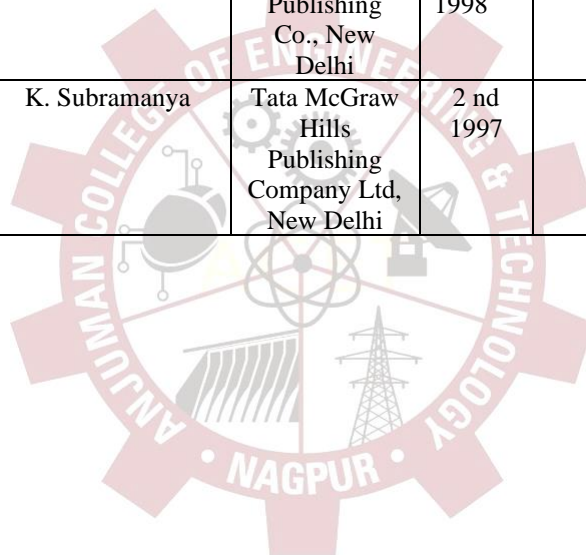


ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Research Paper	Reference book
1 and 5	Fluid Mechanics and Hydraulic Machines	P.N.Modi and S.M. Seth	Standard Book House Delhi	21st 2017	Yes		
All	Fluid Mechanics	A.K.Jain	Khanna Publishers Nai Sarak New Delhi.	9 th 2006	Yes		
2 to 5	Fluid Mechanics	R.K.Rajput	S.Chand & Company Pvt(L), New Delhi	6 th 2015	Yes		
	Hydraulics, Fluid Mechanics and Hydraulic Machine	S.Ramamrutham	Dhanpat Rai Publishing Co., New Delhi	6 th 1998	Yes		
	Flow in open channels	K. Subramanya	Tata McGraw Hills Publishing Company Ltd, New Delhi	2 nd 1997			Yes





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:V	Total Hours Distribution per week		
Total credit:4	Lecture (L):4hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE502T	Name of Subject: Reinforced Cement Concrete Designs	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	4 Hrs

Syllabus

Unit No.1			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction to the Working Stress Method of RCC design. Basic concept in design for flexure, assumptions, design constants. Analysis of the rectangular section. (Balanced, under-reinforced and over-reinforced sections). Introduction to Prestress Concrete: Properties of high grade materials, concepts of prestress concrete, method of pre-stressing, losses in pre-stressing. Various systems for pre-stressing with particular reference to Freyssinet, Magnel Blatton and Gifford Udall system	07		01
	07		
Unit No.2			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Flow through Pipes:

	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction to Limit State Design: Concept of limit state design and philosophy. Characteristic values, partial safety factors, stress strain relationship stress block parameters, failure criteria, types and properties of reinforcement, limit state of Serviceability and limit state of collapse. Limitstates of durability Limit State ofserviceability: Causes and control of cracking: Crack in plastic concrete at early age, cracks due to temperature and shrinkage, restrain induced cracks, cracks due to loading. Needs for crack widthcontrol. Moment– curvature relationship, deflection control of beams and one way slabs. Limit state of collapse in flexure: Analysis and design of singly reinforced rectangular section. Limit state of Collapse in Flexure: Analysis & design of the Tee & L- beamsection. Limit state of Collapse in Shear & Bond: Design of beam for shear , shear span, post cracking resistance, shear mechanism approach , shear failure modes and collapse loads, interaction of shear , flexure and axial force ,Check for bond.	10		2
	10		
Unit No.3			
	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
(Limit state of collapse in compression: Analysis & design of short axiallyloaded column. Columns subjected to uni-axial bending, use of interaction curves.	08		03
Unit No.4			
	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
(Design of one –way, simply supported, single span and cantilever slabs and continuous slab / beam with	07		04



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

IS coefficients, profiles; direct Step method of computing profile length.			
	07		
Unit No.5			
	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Design of rectangular pad / slopped footing for axial load. Design of Simply supported Two-way slab.	04		05
	04		

Text Books	1	P.C.Varghese, Limit State design of Reinforced Concrete, 2nd Edition, PHI Learning Pvt Ltd, 2006
	2	M.L.Gambhir, Design of Reinforced Concrete, 4th Edition, PHI Learning Pvt Ltd, 2011
	3	M.L.Gambhir, Fundamental of Reinforced Concrete Design, 5th Edition, PHI Learning Pvt Ltd, 2011
EBooks	1	Design of Reinforced Masonry Structures, Second Edition, Narendra Taly, Ph.D., P.E., F.ASCE
	2	Building Design and Construction Handbook, Sixth Edition, Frederick S. Merritt
Reference Books	1	Reference Books
	2	“Illustrated Reinforced Concrete Design” by Dr. V.L.Shah and Dr. S.R. Karve, ‘Structures Publications’ , Pune 411009
online TL Material	1	Design of Reinforced Concrete Structures, Civil Engineering, Prof. N. Dhang IIT Kharagpur

List of Code/Handbook

Applicable for Unit No.	Title of Code	Type of code	Year of Publication
ALL	IS 456 PLAIN AND REINFORCED CONCRETE - CODE OF PRACTICE (Fourth Revision)		2000



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:V	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): NAHrs	Practical (P):2Hrs
Subject Code	BTCVE503T	Name of Subject: Civil Engineering Materials, Testing and Evaluation	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 Introduction To Civil Engineering Materials			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction and uses of cement, sand, aggregates	01		01
concrete, mortar and grouts, masonry mortars, rendering, cementations grouts	02		
RCC, clay bricks, calcium silicate bricks, concrete blocks., rubbles, steel, mechanical properties of steel, different applications	02		
Floor and roofing tiles, slates, timber, strength of timber, engineered wood products metals, glass for glazing, glass fibres, glass wool	02		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Water proofing agents: any five water proofing agents, difference between wetting agents and water proof agent	01		
	08		
Unit No.2			
Basic Properties of Materials	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Importance of materials in civil engineering construction, types of materials such as ceramics, concrete, composites, optical /electronics materials, glass, metals, nano-materials, polymers and plastics, wood and other materials, comparison of strengths of various materials.	04		2
Some basic properties of materials such as temperature, energy, specific heat, thermal conductivity, coefficient of thermal expansion, comparison for environmental impact, health and safety.	03		
	07		
Unit No.3			
Special Materials	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Composite Materials: RCC, FRC, AAC(Autoclaved aerated concrete)blocks,WPC(Wood-plastic composites)Material,Cerasheets,3DwallWPCpanels, polymer based materials, steel/concrete composite bridge decks, fibre reinforced plastics structural insulated panels.	03		03
New Techniques in Constructions-Introduction, 3D printing, photo catalytic admixture, self-healing concrete, Biomaterials, zero cement concrete ,hemp lime, wood-glass epoxy composites, bamboo.	04		03
	07		
Unit No.4			
Testing Procedures of Materials	Allotment of Hours		Mapped with CO Number



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	L	T/A	CO
Material Testing, Machines and Equipment Requirements---Necessity of material testing, various testing methods, destructive tests, classification of destructive tests---static, impact and cyclic testing, non-destructive testing- its classification ,visual inspection, penetration test, ultrasonic test.	03		04
Testing Procedures for bricks, reinforcing steel, fine aggregates, coarse aggregates. Documenting the experimental program, including the test procedures, collected data, method of interpretation and final results.	04		
	07		
Unit No.5			
Testing and Evaluation Procedures of Materials	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Quality control- Use of test data/ testing reports in the material selection for various civil engineering projects /construction, Sampling, Acceptance criterion,.	04		05
Code of practice and guidelines in this regards for Cements; Aggregates; Concrete (plain and reinforced); Soils; Bitumen and asphaltic materials; Timbers; Glass and Plastics; Structural Steel.	03		
	07		

References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Research Paper	Reference book
1,2	'Building Construction Handbook	Chudley, R., Greeno (2006),	R. Butterworth Heinemann	(6th ed.)	Yes		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

4	Mechanical Testing of Engineering Materials,	Kyriakos Komvopoulos (2011),	Cognella.				Yes
1,2,4	Highway Materials and Pavement Testing'	Khanna, S.K., Justo, C.E.G and Veeraragavan	Nem Chand & Bros,	Fifth Edition	Yes		
1,2,3	Mechanical Behaviour of Materials	E.N. Dowling (1993)	Prentice Hall, Internatio nal Edition				Yes
1-5	Building Materials, Tes ti ng, and Sustainability	N. Subramania	Publisher: Oxford University Press, New Delhi				Yes
1-5	Related papers published in international journals					Yes	

List of Code/Handbook

Applicable for Unit No.	Title of Code	Type of code	Year of Publication
ALL	IS: 456 – code of practice for plain and reinforced concrete.		2000/2016



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:V	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE504T	Name of Subject: Professional Practices ,Law and ethics	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Human Values, Morals, values and Ethics, Integrity, Work ethics, Service learning, Civic virtue, Respect for others, Living peacefully, Caring, Sharing, Honesty, Courage	08		01
	08		
Unit No.2			
	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Engineering Ethics, Senses of 'Engineering Ethics', Variety of moral issues, Moral dilemmas, Moral Autonomy, Kohlberg's theory, Gilligan's theory,	07		2



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	07		
Unit No.3			
	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Engineering as Social Experimentation, Engineering as Experimentation, Engineers as responsible Experimenters, Codes of Ethics, A Balanced Outlook on Law(Industrial Disputes Act, 1947; Industrial Employment (Standing Orders) Act, 1946; Workmen's Compensation Act, 1923; Building & Other Construction Workers (regulation of employment and conditions of service) Act (1996) and Rules (1998); RERA Act 2017, NBC 2017)	07		03
	07		
Unit No.4			
	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Safety, Responsibilities and rights, Safety and Risk, Assessment of Safety and Risk, Risk Benefit Analysis and Reducing Risk, Collective Bargaining, Professional Rights, Employee Rights	07		04
	07		
Unit No.5			
	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Global issues, Multinational Corporations, Computer Ethics, Weapons Development, Engineers as Managers, Consulting Engineers, Engineers as Expert Witnesses and Advisors, Corporate Social Responsibility	07		05
	07		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Research Paper	Reference book
I,II,III ,IV,V	Professional Ethics	R. Subramaniam	Oxford Publications, New Delhi.				Yes
	Human Values And Professional Ethics by,	Jayshree Suresh and B. S. Raghavan	S. Chand Publications.				Yes
	Ethics in Engineering by-	Mike W. Martin and Roland Schinzinger	Tata McGraw-Hill – 2003.				Yes
	Human Values & Professional Ethics by,	S. B. Gogate	Vikas Publishing House Pvt. Ltd., Noida				Yes
	Professional Ethics and Human Values	A. Alavudeen, R.Kalil Rahman, and M. Jayakumaran	University Science Press.				Yes
	Engineering Ethics & Human Values	M.Govindarajan, S.Natarajan, and V.S.SenthilKumar	PHI Learning Pvt. Ltd – 2009.				Yes



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:V	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE505T	Name of Subject: Advanced Building Materials (Elective-I)	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1			
(CONSTRUCTION MATERIALS)	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
a) Classifications of Construction Materials.	01		01
b) Consideration of physical, Mechanical, thermo-physical Properties, Characteristics behaviour under stress.	03		
c) Selection criteria for construction materials, waste products, reuse and recycling.	03		
	08		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Unit No.2

(MATERIALS FOR MAKING MORTAR AND CONCRETE)	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
a)Lime manufacture, properties, hardening of lime, types of lime, lime concrete uses, cement, aggregates, water, characteristics, properties and uses of Pozzolana materials	03		2
b) Types of mortars, special mortars, properties and applications, admixtures	03		
	06		

Unit No.3

(CERAMIC MATERIALS)	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
a)Classification, Refractories, glass, glass wool.	02		03
b) Mechanical, thermal and electrical properties	03		
c)Fire resistance materials, Uses and application.	03		
	08		

Unit No.4

(POLYMERIC MATERIALS AND STEEL)	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
a) Polymerization mechanism and depolymerisation.	02		04
b)Rubber and plastics, properties, effect of temperature on mechanical properties. Uses and application.	03		
c) Types of structural steels, special steel, alloy steel, stainless steel, light gauge steel.	02		
	07		

Unit No.5



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

(SUSTAINABLE MATERIALS)	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
a)Green concepts in buildings, Green building materials ,Green building ratings IGBC and LEED manuals – mandatory requirements.	04		05
b)Rainwater harvesting &solar passive architecture. Environmental friendly and cost effective building technologies, Requirements for buildings of different climatic regions.	03		
	07		

References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Research Paper	Reference book
1,2	Engineering Materials	Rangwala S.C.	Chortor Publication	1991	TextBook		
3&4	Building Material,	S.K Duggal	New Age International Publication	2006	TextBook		
5	The ideas of green building	A.K.Jain	Khanna publisher		TextBook		
2&3	Building Materials Technology Structural Performance & Environmental Impact	Bruntley L.R	McGraw Hill Inc	1995	TextBook		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:V	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE506T	Name of Subject: Climate Change and its Mitigation (Elective-II)	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 Earth Climate Change			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction to climate change ;History and trends of climate	02		01
Atmosphere –weather and climate	01		
Causes of global and regional climate change	01		
climate parameters – Temperature, Rainfall, Humidity	01		
Wind – Global ocean circulation and its effect	01		
Carbon cycle	01		
	07		
Unit No.2 Greenhouse Gases			
Detail of Topic	Allotment of Hours		Mapped with CO Number



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	L	T/A	CO
Introduction and effect of Carbon dioxide, methane, nitrous oxide, water vapor, ozone and chlorofluorocarbons	02		2
Chemistry of greenhouse gases	01		
Sources and sinks, their cycle in atmosphere	01		
Radiative forcing	01		
Effects on plants and animals	01		
instruments used for quantification	01		
	07		
Unit No.3 Impacts of Global Climate Change			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Impacts of Climate Change on various sectors – Agriculture, Forestry	02		3
Methods and Scenarios, changes in agricultural production	02		
Impact on Human Health, Industry and society	01		
Spread of epidemics and Risk of Irreversible Changes.	01		
Traditional practices to cope with climate change impacts	01		
	07		
Unit No.4 Waste to Energy, Clean Technologies and Greener Fuels			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction to MSW & Bio waste, Biomedical, Industrial waste, International and Regional cooperation	02		4
Alternate Energy: Hydrogen, CBS, Bio-fuels, Solar Energy, Wind, Hydroelectric Power	02		
Examples of future Clean Technologies, Biodiesel, Natural Compost, Eco- Friendly Plastic	02		
Study of waste to energy projects	01		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

		07		
Unit No.5 Climate Change Mitigation				
Detail of Topic	Allotment of Hours	Mapped with CO Number		
		L	T/A	CO
Climate change response measures: definition and evolution..	02			5
Introduction to mitigation of GHGs and stabilization scenario	01			
characteristics of mitigation in regional and national context	01			
mainstreaming climate change in development agenda	01			
short-term mitigation options Role of fossil fuels in climate change	01			
Role of Governments, industries, and individuals	01			
		07		

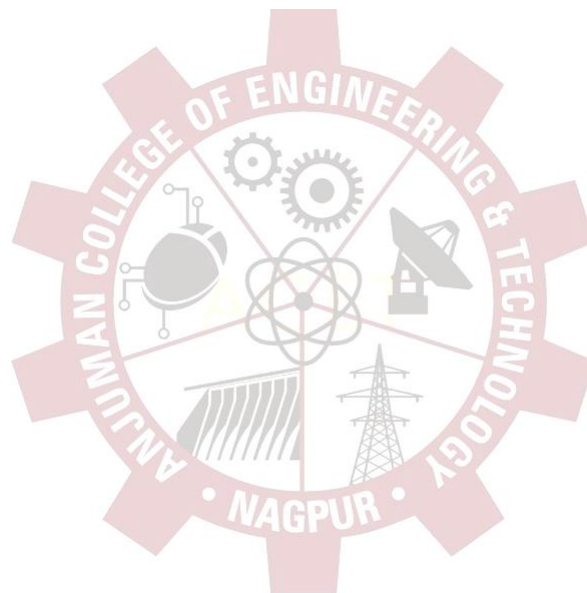
References							
Appl icabl e for unit No.	Name of book	Name of Author	Name of Publisher	Editi on	Category		
					Text Book	Reserch Paper	Reference book
1	Essentials of the Earth's Climate System	Roger G. Barry&Eileen A. Hall-McKim	Cambridge University Press	1st	Text Book		
2,3	Climate Change and Greenhouse Gases Emissions	Pratap Bhattacharyya(Aut hor),SushmitaMun da&Pradeep Kumar Dash	CRC Press	1st	Text Book		
2,3,4	Global Climate Change	Suruchi Singh, Pardeep Singh, S. Rangabhashiyam, K.K. Srivastava	Elsevier	1st	Text Book		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

1,2,3	Implementing the climate regime	Jon Hovi, Olav and Stokke GeirUlfstein	International compliance, Earthscan	2005	Text Book		
-------	---------------------------------	--	-------------------------------------	------	-----------	--	--





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:V	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE506T	Name of Subject: Advanced Concrete Technology (Elective-II)	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 INTRODUCTION TO CONCRETE			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Historical background, composition of concrete, general note on strength mechanism, recent practice and future trends	01		01
Cement – Chemical composition, hydration, heat of hydration, hydrated structure, various types of cement, grades of cement, test in g, Hydration Process and Hydrated Cement Paste of blended cement, of cement as per Indian standard.	03		
Aggregates-Utility in concrete, classification, effect of geometry & texture, strength, mechanical properties, moisture content, water absorption, bulking of sand, deleterious substances, sieve analysis, various grading and grading requirements	03		
Water-General Requirements & limiting values of impurities	01		
	08		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Unit No.2 SPECIAL CONCRETE AND CONCRETING TECHNIQUES

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
a) Concrete with difference cementitious materials: fly ash, GGBS, Silica fume. b) Concrete with different Aggregates: No fines, high weight, gap graded, Recycled Aggregate, Auto clave aerated concrete.	03		2
c) Modified property: high density, high performance, ultra rapid hardening concrete, transportation concrete, Fiber reinforcement concrete. d) Techniques: RMC, Underwater concrete , Shot crete, nano concrete.	03		
	06		

Unit No.3 DESIGN OF CONCRETE

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Concept of Design of concrete, Quality control (field and statistical) Indian Standard Method, Comparison with British and .American Method of Mix Design. Acceptance criteria..	02		3
Design of High Strength Concrete Mixes, Design of Light Weight Aggregate Concrete Mixes, Design of Fly Ash Cement Concrete Mixes, Design of High Density Concrete Mixes, Standards, Specifications and Code of Practice.	05		
	07		

Unit No.4 BEHAVIOR AND STRENGTH OF CONCRETE

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Failure modes in concrete, type deformation stress strain relation and modulus of elasticity, Shrinkage cause, Factors Affecting and control, creep, causes, Factores influencing and effects.Effects of temperature.	04		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Compressive strength, Tensile strength, Fatigue strength, and impact strength, Factors influencing strength of concrete..	03		4
	06		
Unit No.5 DURABILITY AND TESTING OF CONCRETE			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Water As An Agent Of Deterioration, Permeability Of Concrete, Classification of Causes of Concrete Deterioration, Deterioration By Surface Wear/Abrasion, Freezing And Thawing of Concrete, AlkaliAggregate Reaction (Alkali-Silica Reaction / Alkali-Carbonate Reaction), Deterioration By Fire,Guide To Durable Concrete	04		5
Advanced Non-Destructive Testing Methods: Ground Penetration Radar, Probe Penetration, Pull Out Test, Break off Maturity Method, Stress Wave Propagation Method, Electrical/Magnetic Methods, Nuclear Methods And Infrared Thermograph, Core Test	04		
	08		

References							
Appl icabl e for unit No.	Name of book	Name of Author	Name of Publisher	Editi on	Category		
					Text Book	Reserch Paper	Reference book
1&2	Concrete Technology	MSShetty;	S.ChandPu blication New Delhi		Text Book		
3	Concrete Technology	PKumar Mehta,	Indian Concrete Institute		Text Book		
4&5	Properties Of Concrete	AM.Neville	Pearson Education	1	Text Book		
3	Concrete Technology	ML Gambhir;	TataMcGraH ill		Text Book		



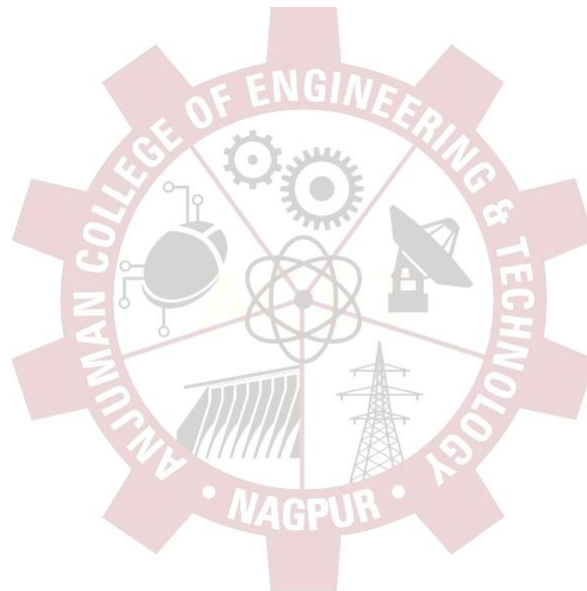
ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

3	Concrete mix design for flyash and superplasticizer	Kishorekaushal	ICIBulletin	Apr une 1997		Research paper	
---	---	----------------	-------------	--------------------	--	----------------	--

List of Code/Handbook

Applicable for Unit No.	Title of Code	Type of code	Year of Publication
2	IS269- 2013		2013
2	IS516- 1959		1959
4	IS 3812 part 1	Specification of flyash	
3	IS10262- 2009		2009





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VI	Total Hours Distribution per week		
Total credit:4	Lecture (L):3hrs	Tutorial/Activity (T/A): 1Hrs	Practical (P):2Hrs
Subject Code	BTCVE601T	Name Of	Subject: Estimating and Costing
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 Introduction			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction: Importance and purpose of the subject, Units of measurement as per I.S.1200. Items of work and Description of items of work,,	01		01
Administrative approvals, technical sanction, preliminary estimates. objectives, and its methods	02		
Study of Earthwork estimates in road, hill roads and canals, methods of consumptions of earthwork.	01		
Detailed estimates, objects, importance, accuracy. Methods of detailed estimates, Detailed estimates of load bearing and framed structures	04		
	08		
Unit No.2 Calculation of steel , Tender and contracts			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Calculation of reinforcing steel with Bar bending Schedule.	03		2
Tenders and Contracts: Method of carrying out works, tender notice, acceptance of tender, essentials of contract, type of contracts, contract documents, land acquisition act, Legal aspects of various contract provisions, Arbitration.	03		
Public work department procedure of work: Organisation of Engineering department, Methods of carrying out works, stores, stocks, Tools and plants, Mode of payment, Public work account, Power of sanctions	01		
	07		
Unit No.3 Specifications:			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Specifications: IS 1200 Introduction, Purpose and principles of specifications writing, Types of specifications, writing and developing	02		3
Detailed specifications of Important items of building and road work.	03		
Classification of cost, direct and indirect charges, distribution of overheads, M.A.S Account, issue rates and stores account.	02		
	07		
Unit No.4 Rate Analysis			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Introduction, Purpose and principles of CSR, Factors affecting analysis of rates, labour guidelines from National Building Organization, Task work	04		
Market rates of materials and labour, Rate analysis of major items of work	03		
	07		4
Unit No.5 Valuation			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Purpose of valuation, Factors affecting property price and cost, Types of Value.	03		
Real Estate, Tenure of land, Free hold and lease hold, sinking fund, Depreciation, and its methods, Capitalised value, Methods of valuation, Net & Gross income, Rent fixation.	04		
	07		5

References							
Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
1 to 5	Estimating and Costing	by Dutta					
1 to 5	Estimating and Costing	by Chakraborty,					
5	Valuation	by Roshan Namavati					
5	Philosophy of Valuation	S. S. Rathore.					

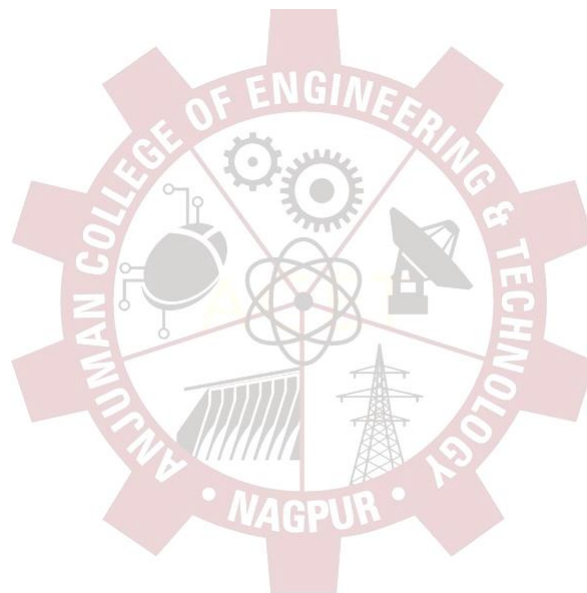


ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

List of Code/Handbook

Applicable for Unit No.	Title of Code	Type of code	Year of Publication
1 to 5	Handbook for quick cost estimates. By Ball, J R		
4	IS 14835 (2000): Guidelines for Estimating Unit Rate of Items		





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VI	Total Hours Distribution per week		
Total credit:3	Lecture (L):2hrs	Tutorial/Activity (T/A): 1Hrs	Practical (P):0Hrs
Subject Code	BTCVE602T	Name of Subject: Construction Engineering and Managemen	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

UNIT NO.1			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Importance of construction industry in economic development and economic growth of India. Construction-key industry of India, Law of Demand, Law of supply, Laws of returns to the scale, types of costs	04	04	01
UNIT NO.2			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Factors of production with special reference to construction industry, Turnkeyconstructionprojects,Deprecation- its types and methods, The concept of business cycle, Affordable housing schemes by Government of India	04	04	2
UNIT NO.3			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Types of market structure, Monopoly, oligopoly and monopolistic competition, Recession, inflation and Deflation, Direct and indirect taxes	04	04	3
UNIT NO.4			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Meaning of Marketing managements, concepts of Marketing, Marketing Mix, Administrative and cost plus pricing, Channels of distribution, Advertising and sales promotion	03	03	4
UNIT NO.5			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Meaning, Nature and scope of Financial management, Sources of Finance, profit and loss account, Balance sheet, merger and acquisitions of business, Concept of stock market	04	04	5

References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
I.II,III,IV ,V	Modern Economics	H.L. Ahuja					YES
	Monetary Economics	M.L. Seth					YES
	Industrial Management	.K. Chopde, A.M. Sheikh					YES
	Business Organization and Management	S.A. Sherlekar					YES
	Modern Economic Theory	K.K. Dewett					YES



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VI	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): N/AHrs	Practical (P):0Hrs
Subject Code	BTCVE603T	Name of Subject: Water Resource Engineering	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

UNIT NO.1			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Hydrologic cycle, Water availability in India, Water balances, National Water Policy	01		01
Precipitation: Types, Measurement, Data analysis and presentation, Probable Maximum Precipitation	02		
Evaporation and its measurement, Evapotranspiration and its measurement, Penman Monteith method, Infiltration: Horton's equation and Green Ampt method.	02		
Concept of basin as a unit for development, Runoff: drainage basin characteristics, Estimation of runoff, Streamflow measurement	02		
Concepts of unit hydrograph, S-curve hydrograph, Synthetic hydrograph, Stage discharge curve	02		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	09		
Unit No.2 Water application and Irrigation methods			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Systems of Irrigation: Lift irrigation, Tank irrigation, Well irrigation,	02		2
Irrigation methods: Surface and Sub-Surface Irrigation, Sprinkler and Drip Irrigation	02		
Duty, Delta and Base period, Computation of duty and frequency of Irrigation	02		
Soil Moisture and Consumptive use, Irrigation water quality, Crop rotation and Irrigation assessment	02		
	09		
Unit No.3 Reservoir and Earthen dam			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Reservoir: Types, Investigations, Site selection, Zones of storage,	01		3
Safe yield, Reservoir storage capacity, Reservoir sedimentation and control.	03		
Dams: Types of dams, Earth and rockfill dams, typical sections of earth and rockfill dams	02		
Analysis and design of earthen embankments, seepage control in earth dams	03		
	08		
Unit No.4 Gravity Dams and spillways			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Gravity dams, overflow and non-overflow sections, Forces acting on Gravity dams	02		4
analysis and design of gravity dams, Foundation treatment in concrete dams, joints, water seals, galleries in concrete dam	03		
Types of spillways, design of Ogee spillway,	01		
Types of gates in spillways and types of energy dissipation below spillways	01		
	07		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Unit No.5 (Canals and hydraulic structures)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Alignment of canals, canal capacity, losses, FSL of canal, Kennedy's silt theory, Lacey's regime theory, use of Garrets diagrams and Lacey's Regime diagrams.	03		5
Lining of irrigation channels, design of lined canal, balancing depth, Cross section of an Irrigation channel	02		
Water logging: Causes, surface and sub-surface drains	01		
Introduction: hydraulic structures, storage, diversion, conveyance and distribution structures	01		
	07		

References

Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
1	A Textbook of Hydrology	Dr. P. Jaya Rami Reddy	University Science Press		YES		
1	Engineering Hydrology	MSubramanya, K.	Tata McGraw Hill, New Delhi				Yes
2 to 5	Irrigation Water Resources and Water Power Engineering,	Modi, P.N.	Standard Book House, New Delhi		Yes		
2 to 5	Irrigation Engineering	G. S. Birdie and R. C. Das	DhanpatRai Publishing Company pvt. Ltd., New Delhi				Yes
2 to 5	Irrigation Engineering and Hydraulic Structures	Garg Santosh Kumar	Khanna Publishers, New Delhi		Yes		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VI	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 1Hrs	Practical (P):0Hrs
Subject Code	BTCVE604T	Name of Subject: Repairs & Rehabilitation of Civil Engineering Structures (Elective- III)	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 Deterioration of concrete in structures			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	
Physical processes of deterioration like Freezing and Thawing, Wetting and Drying,	02		01
Abrasion, Erosion, Pitting, Chemical processes like Carbonation, Chloride ingress, Corrosion	02		
Alkali aggregate reaction, Sulphate attack Acid attack, temperature and their causes, Mechanism, Effect, preventive measures	02		
Cracks: Cracks in concrete, type, pattern, quantification, measurement & preventive measures	02		
	08		
Unit No.2 Non Destructive Testing			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Nondestructive test methods for concrete including Rebound hammer, Ultrasonic pulse velocity,	03		2
Rebar locator, Corrosion meter, Penetration resistance and Pull out test, Core cutting	02		
Corrosion: Methods for corrosion measurement and assessment including half-cell potential and resistivity, Mapping of data	02		
	07		
Unit No.3 Failure of buildings			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Definition of building failure-types of failures- Causes of FailuresFaulty Design	02		03
Accidental over Loading, Poor quality of material and Poor Construction practices	02		
Fire damage - Methodology for investigation of failures-diagnostic testing methods and equipments-repair of cracks in concrete	03		
	07		
Unit No.4 Materials for repair and rehabilitation			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Admixtures- types of admixtures- purposes of using admixtureschemical composition- Natural admixtures- Fibres-wraps- Glass and Carbon fibre wraps- Steel Plates- Concrete behavior under corrosion, disintegrated mechanisms- moisture effects and thermal effects –	04		4
Visual investigation- Acoustical emission methods- Corrosion activity measurement- chloride content – Depth of carbonation- Impact echo methods- Ultrasound pulse velocity methods- Pull out tests.	03		
	07		
Unit No.5 Investigation of structures &Repair Techniques			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Distress, observation and preliminary test methods. Case studies: related to rehabilitation of bridge piers, dams, canals, heritage structures, corrosion and erosion damaged structures.	03		5



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Grouting, Jacketing, Shotcreting, externally bonded plates, Nailing, Underpinning and under water repair; Materials, Equipments, Precautions and Processes.	04		
	07		

References

Appli cable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
1 to 5	Maintenance & Repair of Civil Structures	B.L. Gupta & AmitGupta			yes		
1 to 5	Rehabilitation of Concrete Structures	B. Vidivelli	Standard Publishers		yes		
1 to 5	Concrete Bridge Practice Construction, Maintenance & Rehabilitation	V. K. Raina			yes		
1 to 5	Concrete Structuresprotection Repair and Rehabilitation	R.Doodge Woodson	BH Publishers				



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VII	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 1Hrs	Practical (P):0Hrs
Subject Code	BTCVE701T	Name of Subject: Design of Steel Structure	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 (Introduction to design philosophy and Structural fasteners)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Steel as a structural material and its properties, various rolled sections, Introduction to plastic analysis: Shape factor, plastic hinge formation and collapse mechanism for beams. concept of Limit state design philosophy, Introduction to IS 800:2007 and steel table.	02		01
Types of joints and fasteners: Lap joint, Butt Joint with single and double cover plate, packing plate. Efficiency of joint.	02		
Types of Bolts, Ordinary and HSFG bolts, shearing, bearing and ultimate tensile strength of bolts, prying force, Strength reduction factors, Bolt strength.	02	1	
Types of weld, size and effective throat, fillet and butt weld intermittent weld, weld strength.	02	1	
	08		
Unit No.2 (Design of Axially Loaded Members)			



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Tension members: Yield and rupture strength of plate, chain and staggered arrangement of fasteners, Block shear failure, shear lag effect in angles. Lug angle.	04	1	2
Compression Members: Behaviour of slender compression member, local and overall buckling, section classification, effect of initial out of straightness, eccentricity and residual stresses, Elastic stability of columns, Perry- Robertson approach and IS provisions. Design of rolled I, angle and Chanel sections.	04	1	
	08		
Unit No.3 (Design of Members subjected to Bending.)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Simple Beam: Elastic and plastic behaviour, flexural strength, Low and high shear cases, deflection, web buckling and web crippling effect. Laterally supported and unsupported beams. Design of rolled I section.	02		3
Design of Built up Beams and plated rolled beam.	02	1	
Plate girder: Serviceability criterion, flexural and shear strength, Simple post critical method and tension field theory, longitudinal and transverse stiffeners, Design of welded plate girder. Curtailment of plates.	04	1	
	08		
Unit No.4 (Design of Members subjected to Combined Loading)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Members subjected to axial load and uniaxial or biaxial bending. Design of Beam – Column.	04	1	4
Design of Built up Column, economical section, Single and double lacing, battened columns.	04	1	
	08		
Unit No.5 (Design of Column Bases)			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Design of slab base, gusseted base and moment resistant bases.	04	1	5
	04		

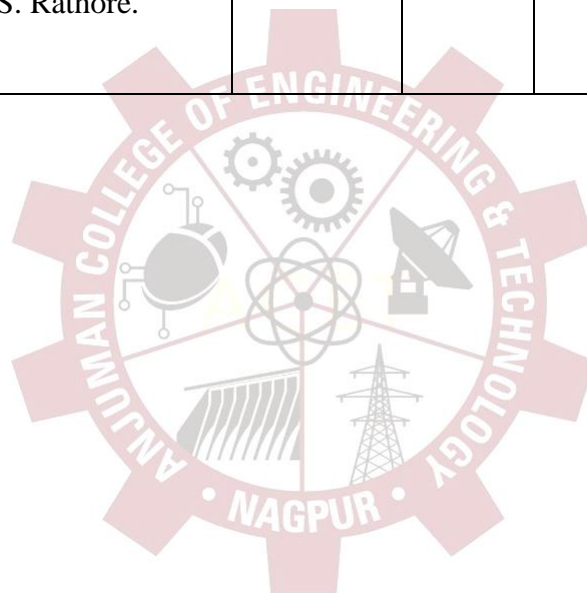


ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

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	Estimating and Costing	by Dutta					
1 to 5	Estimating and Costing	by Chakraborty,					
5	Valuation	by Roshan Namavati					
5	Philosophy of Valuation	S. S. Rathore.					





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VII	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE702T	Name of Subject: Building Construction Practices (Elective – IV)	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 Overview of Building components			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Classification of Buildings As per National Building Code-Part III (2005) Group A to 1 Latest code may be referred. As per Types of Constructions-Load Bearing Structure, Framed Structure, Composite Structure.	03		01
Building Components Building Components and their function. Substructure – Foundation, Plinth and Plinth Filling. Superstructure – Walls, Partition wall, cavity wall, Sill, Lintel, Doors and Windows, Floor, Mezzanine floor, Roof, Columns, Beams, Parapet.	04		
	07		
Unit No.2 Building Foundation & Specification			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	L	T/A	CO
Building foundations – basements – temporary shed – centering and shuttering – slip forms – scaffoldings – de-shuttering forms – Fabrication and erection of steel trusses – frames – braced domes – laying brick – roof finishes – acoustic and fire protection;	03		2
Specifications, details and sequence of activities and construction coordination – Site Clearance – Marking – Earthwork ,concrete hollow block masonry – flooring – damp proof courses – construction joints – movement and expansion joints – pre cast pavements	04		
	07		
Unit No.3 Construction of Sub Structure			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Sub Structure Construction- Techniques of Box jacking – Pipe Jacking -under water construction of diaphragm walls and basement	02		3
Tunnelling techniques – Piling techniques - well and caisson - sinking cofferdam	02		
cable anchoring and grouting-driving diaphragm walls, sheet piles - shoring for deep cutting - well points - Dewatering and stand by Plant equipment for underground open excavation	03		
	07		
Unit No.4 Construction of Super Structure			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Super Structure Construction- Launching girders, bridge decks, off shore platforms –	02		4
special forms for shells - techniques for heavy decks – in-situ pre-stressing in high rise structures,.	02		
Material handling - erecting light weight components on tall structures - Support structure for heavy Equipment and conveyors –	03		
Erection of articulated structures, braced domes and space decks; Prerequisite:	02		
	7		
Unit No.5 Building Maintenance			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Cracks : Causes and Types of Cracks, Identification and Repair of Cracks. Grouting and Guniting.	02		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Settlement of Foundation: Types, Causes and Remedial measures	02		5
Demolition: Necessity, Method of Demolition- Hand Demolition, Machine Demolition, Controlled Blasting. Demolition Implosion, Precautions During Demolition.	02		
Water Proofing: Necessity and importance, material used for Water Proofing, Non-conventional method of water proofing introduction of crystalline waterproofing, cement base polymer coatings, conventional waterproofing methods-brick bat coba waterproofing, Box type water proofing, Injection/grouting. Plinth Protection necessity and material used, Damp Proof Course.	02		
	08		

References							
Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Reference book
1	National Building Code	BIS New Delhi				yes	
1 to 2	BIS 962- 1989 Code of Architectural and Building Drawing	BIS New Delhi					
3	BIS 1038- 1983 Steel Doors. Windows and Ventilators BIS	BIS New Delhi					
2 to 5	Building Construction	S. P. Arora	Dhanpat Rai Publishing Co Pvt Ltd		yes		
2 to 5	Building Construction	S. C. Rangwala		25th	yes		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VII	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE703T	Name of Subject: Air Pollution & Solid Waste Management (Elective-V)	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction to air pollution: Definition, atmosphere & its zones, Classification and sources of air pollutants, Impacts of air pollution on human health, vegetation, animals, building materials, structures, and atmosphere, soil and water bodies, Global and regional environmental issues of air pollution: Ozone depletion, Climate change, Global warming, Acid rain.	03		01
Meteorological parameters: Primary and secondary parameters, atmospheric stability, plume behaviour. Wind rose diagram, Air Quality Index (AQI), Standards for air pollution (as per Indian Standards and CPHEEO),	04		
	07		
Unit No.2			
Detail of Topic	Allotment of Hours		Mapped with CO Number



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	L	T/A	CO
Air sampling and measurement: Ambient air sampling and stack sampling, collection of particulate and gaseous pollutants, (adsorption, absorption, incineration, condensation), site selection criteria, methods of estimation. Stack height determination	04		2
Air pollution controls methods and equipments: Principles of control methods for particulates and gaseous pollutants, gravity settlers, electrostatic precipitators, bag filters, cyclones and wet scrubbers	04		
	08		
Unit No.3			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction to solid waste management(SWM): Structure , necessity and responsibility, Sources, Quantity and quality, Sources of solid waste, classification and components, physical and chemical characteristics, per capita contribution, sampling and analysis	04		3
Collection and transportation of solid waste: Method of collection, equipment used for collection and transportation, transfer stations, optimization of transport route	04		
	08		
Unit No.4			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Solid waste processing: Methods of processing, merits and demerits of various methods, 3R concept	03		4
Disposal methods: Composting of waste, methods of composting, factors affecting composting Sanitary land filling: Site requirements, methods, leachate management	04		
	7		
Unit No.5			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Incineration: Principles of incineration, types of incinerators, advantages and disadvantages, Pyrolysis, Gasification, Refuse derived fuel(RDF), Biogas	04		

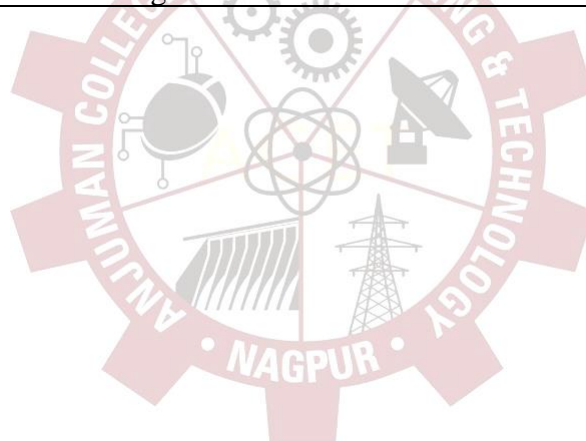


ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Control of gases: Carbon Footprint, Emerging technologies and strategies to mitigate air pollution, Current challenges and way forward	03		5
	07		

References	
1	M.N. Rao&H.V.N.Rao, “ Air Pollution”, Tata McGraw Hill Publishing Co. Ltd.
2	C.S.Rao, “Environmental Pollution Control Engineering”, Wiley Estern Ltd. New Delhi.
3	Gurjar, B.R., Molina, L., Ojha, C.S.P. (Eds.), “Air Pollution: Health and Environmental Impacts”, CRC Press. 2010.
4	A. D. Bhide, &Sunderesan B.B., “Solid Waste Management in developing countries, INSDOC, N. Delhi
5	Treatment and Disposal of Solid and Hazardous Wastes Kindle Edition by DebashishSengupta, Brajesh K. Dubey, SudhaGoel
6	Solid and Hazardous Waste Management, Second Edition by M. N. Rao
7	. Municipal Solid Waste Management by P Jayarama Reddy
8	Municipal solid waste management rules Handbook





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VII	Total Hours Distribution per week 3-0-0		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE704T	Name of Subject: Earthquake Resistant Structure(Elective-VI)	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Engineering seismology, Elastic rebound theory, Theory of plate tectonics and movement of Indian plate, Seismic waves. Seismic intensity, Richter scale, Introduction on to tsunami. Seismic zoning maps of India , Response spectra. Strong motion characteristics.	06		01
	06		
Unit No.2			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Earthquake effects on the structures, combination of loads, Seismic damages during past earthquakes, Effect of irregularities and building architecture on the performance of RC structures	06		2



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	06		
Unit No.3 Construction of Sub Structure			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Seismic methods of analysis, seismic design methods, Mathematical modelling of multi-storeyed RC buildings with modelling of floor diaphragms	06		3
	06		
Unit No.4			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Design of multi – story RC structure foundation as per latest (IS 1893- 2016) by Equivalent static lateral load method and Response spectrum Method, Introduction to Time history method. Concept of Capacity based design of soft story RC building. Concept of shear walls. Ductile detailing as per latest IS :13920-2016	06		4
	06		
Unit No.5			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Seismic retrofitting, Source of weakness in RC framed building, Various retrofitting techniques, case studies. Introduction to Base Isolation system. IS code provision for retrofitting of masonry structures, failure modes of masonry structures and repairing techniques	06		5
	06		

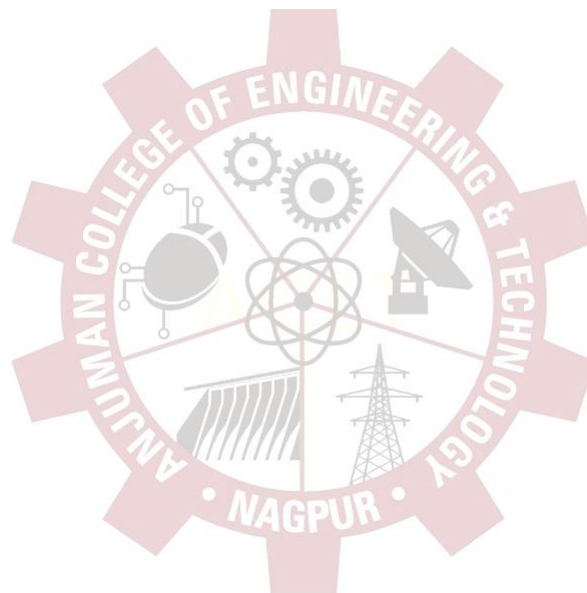
References						
Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category	
					Text Book	Reserch Paper
1	National Building Code	BIS New Delhi				yes
1 to 2	BIS 962- 1989 Code of	BIS New Delhi				



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	Architectural and Building Drawing						
3	BIS 1038- 1983 Steel Doors. Windows and Ventilators BIS	BIS New Delhi					
2 to 5	Building Construction	S. P. Arora	Dhanpat Rai Publishing Co Pvt Ltd		yes		
2 to 5	Building Construction	S. C. Rangwala		25th	yes		





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VIII	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 1Hrs	Practical (P):0Hrs
Subject Code	BTCVE801T	Name of Subject: Construction Method and Equipment Management	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 Construction Industry and Constructions Projects			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction - Types of Construction, Selection of Professional Services, Construction Contractors, Legal and Regulatory Requirements, Changing Environment of the Construction Industry.	02		01
Role, responsibility of projects Manager, Role of PMC (Project Management Consultants) on major projects. Various construction Equipment's with its Advantages, Disadvantages and its Use	02		
Importance of construction industry, Phases of a construction project, participants or stakeholders of a construction project.	02		
	08		
Unit No.2 Project Organization			
Detail of Topic	Allotment of Hours		Mapped with CO Number



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

	L	T/A	CO
Construction company, forms of business organization, structure of construction organization	02	1	2
organizing for project management, management levels, traits of a project manager	02	1	
Traits of a project co-ordinator, ethical conduct for engineers, factors behind the success of a construction organization	03		
	07		
Unit No.3 Construction Planning			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Work break down structure, Planning Techniques-terminologies used, bar charts,Milestone charts, preparation of network diagrams	02		3
Activity cost and time estimation in PERT and CPM techniques, Line of Balance Technique, network technique advantages.	02	1	
Precedence Network Analysis, software's in Construction scheduling (MSP, primavera).	04	1	
	08		
Unit No.4 Construction Labour and Equipment Management			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Need for legislation, Acts regarding fixing terms of employment, Acts regarding providing proper working conditions.	02	1	4
Acts regarding social security, need for mechanization, financial aspects of construction plants and equipments.	02	1	
factors affecting selection of construction equipments, planning of construction equipments, factors affecting the cost of owning and operating the construction equipments.	03		
	07		
Unit No.5 Construction Materials Management			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Importance of material management and its role in construction industry, material management functions, Material Procurement Process in construction organization,inventory management.	03	1	5
Importance of material management and its role in construction industry, material management functions,	03		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Material Procurement Process in construction organization, inventory management.			
Integrated approach to materials management, Role of materials manager.	01		
	07		

References							
Applicable for unit No.	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Referen ce book
1,2	Scheduling Construction Projects, John Wiley & Sons, 1986. CN7204	Willis, E. M.			yes		
4	Civil Engineering Contracts and Estimates - Universities Press	by B. S. Patil –					yes
1,2,4	The Indian Contract Act (9 of 1872), 1872-Bare Act- 2006 edition, Professional Book	by Roshan Namavati			yes		
1,2,5	Law of contract Part I and Part II, Dr. 2005 Edition, Allahabad Law Agency	R.K. Bangia -					yes



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VII	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE802T	Name of Subject: Digital Land Surveying & Mapping	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 INTRODUCTION TO SURVEYING			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Overview of general survey: Introduction , Need , Application and Types	02		01
Overview of digital land survey:- Introduction, Establishment of control points.	03		
Introduction to advanced digital surveying methods.	03		
	08		
Unit No.2 GPS			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Introduction , components	01		2
GPS signals: Introduction , GPS signals , GPS user segment: Introduction, GPS Receiver code receiver , frequency receiver	02		
GPS software – Field software , office software	02		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

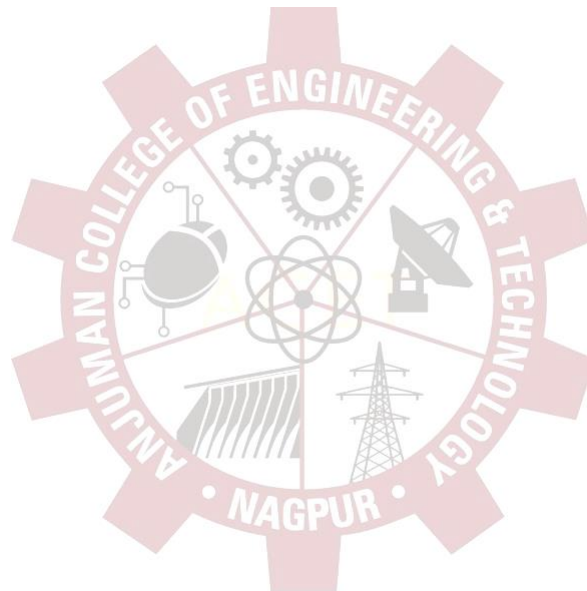
GPS data collection and processing , ERRORS IN GPS OBSERVATION	03		
	08		
Unit No.3 DGPS and Data processing			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Introduction to Differential GPS	02		3
DGPS data application and Processing	03		
DGPS control station and loop closure technique	03		
	08		
Unit No.4 TOTAL STATION			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Introduction, parts , accessories and setting of total station	02		4
Measurements of distance , horizontal angle, vertical angle and height, Contouring and mapping	03		
Errors in Total station , errors and error propagations and survey specification	03		
	08		
Unit No.5 MAPPING			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Mapping fundamentals , basics	02		5
Mapping software and Automated Mapping	02		
Working steps and establishment of control point	02		
Detailing of digital surveying	02		
	08		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Applicable for unit No.	References					Category		
	Name of book	Name of Author	Name of Publisher	Edition		Text Book	Reserch Paper	Referen ce book
1 to V	Digital Land Surveying and Mapping	P.K.Garg	New Age International Publisher		yes			
II, IV	Advanced Surveying: Total Station, GPS, GIS & Remote Sensing	GopiSatheesh, R.Sathikumar, N Madhu	Pearson	2017	yes			





ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE & TECHNOLOGY

B.TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)

Sem:VIII	Total Hours Distribution per week		
Total credit:3	Lecture (L):3hrs	Tutorial/Activity (T/A): 0Hrs	Practical (P):0Hrs
Subject Code	BTCVE803T	Name of Subject: Disaster Management	
Examination Scheme			
Internal Marks:	University	Minimum Passing Marks:	Examination Duration:
30 Marks (15 Marks for sessional examination) (15 Marks for Activity based)	70 Marks	45 Marks	3 Hrs

Syllabus

Unit No.1 Disaster Management			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Disaster and Disaster Management- concept	02		01
Issue concerned with Disaster Management	03		
Phase Of Disaster Management.	03		
Types Of Disaster –An Introduction	08		
Natural disaster and man made disaster			
Unit No.2 disaster case studies & Disaster Management in India An overview			
Detail of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Bhopal disaster-A case study	01		2
Slow onset Disaster & rapid onset disaster	01		
Simple and complex Disaster	01		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Tsunami: A case study	01		
Cyclone phallin 2013: A case study	01		
Evolution of disaster management in india, disaster and disaster management in India	01		
National Institute disaster Management ,National Disaster management Act 2005, the national policy on disaster management ,2009	01		
	07		
Unit No.3 Refugee Problem			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
National plan on disaster management 2016	02		3
Refugee problem	03		
Impact of disaster on the lives of refugee	03		
Problem of Women and children during disaster	08		
Unit No.4 TOTAL STATION			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Introduction, parts , accessories and setting of total station	02		4
Measurements of distance , horizontal angle, vertical angle and height, Contouring and mapping	03		
Errors in Total station , errors and error propagations and survey specification	03		
	08		
Unit No.5 MAPPING			
	Allotment of Hours		Mapped with CO Number
Detail of Topic	L	T/A	CO
Mapping fundamentals , basics	02		5
Mapping software and Automated Mapping	02		
Working steps and establishment of control point	02		
Detailing of digital surveying	02		
	08		



ANJUMAN COLLEGE OF ENGINEERING & TECHNOLOGY
MANGALWARI BAZAAR ROAD, SADAR, NAGPUR - 440001.

DEPARTMENT OF CIVIL ENGINEERING

Applicable for unit No.	References						
	Name of book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Reserch Paper	Referen ce book
1 to V	Digital Land Surveying and Mapping	P.K.Garg	New Age International Publisher		yes		
II, IV	Advanced Surveying: Total Station, GPS, GIS & Remote Sensing	GopiSathesh, R.Sathikumar, N Madhu	Pearson	2017	yes		

