

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY**CIRCULAR NO.SU/Engg./S.Y.B.Tech./02/2017**

It is hereby informed to all concerned that, the syllabi prepared by the Committees & recommended by the Dean, Faculty of Science & Technology, the **Academic Council at its meeting held on 20 & 21 June 2017 has accepted the following syllabi in accordance with Choice Based Credits & Grading System for all Branches S.Y.B.Tech** under the Faculty of Science & Technology as enclosed herewith.

Sr.No.	Syllabi as per CBC & GS
[1]	Second Year B.Tech.[Civil Engineering],
[2]	Second Year B.Tech. [Mechanical Engineering],
[3]	Second Year B.Tech. [Agricultural Engineering],
[4]	Second Year B.Tech.[Electrical Engineering],
[5]	Second Year B.Tech. [Plastic & Polymer Engineering],
[6]	Second Year B.Tech [Electronics & Telecommunication Engg.],
[7]	Second Year B.Tech. [Computer Science Engineering].

This is effective from the Academic Year 2017-2018 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.

REF.NO. SU/S.Y.B.TECH.2017/2173-84

Date:- 28-06-2017.

★

★

★

★

★

★

*Deputy Registrar,
Syllabus Section.*

Copy forwarded with compliments to :-

- 1] **The Principals, affiliated concerned Colleges, Dr. Babasaheb Ambedkar Marathwada University.**
- 2] The Director, University Network & Information Centre, UNIC, with **a request to upload this Circular on University Website.**

Copy to :-

- 1] The Director, Board of Examinations & Evaluation,
- 2] **The Section Officer,[Engineering Unit] Examination Branch,**
- 3] The Section officer, [Eligibility Unit],
- 4] **The Programmer [Computer Unit-1] Examinations,**
- 5] **The Programmer [Computer Unit-2] Examinations,**
- 6] The In-charge, [E-Suvidha Kendra],
- 7] The Public Relation Officer,
- 8] The Record Keeper,

SCHEME AND DETAILED SYLLABUS
of
S. Y. B. Tech. (Civil Engineering)
Under Choice Based Credit & Grading System
(w.e.f. academic year 2017-18 & onwards/-)

FOUR YEAR DEGREE COURSE IN SCIENCE & TECHNOLOGY



DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD

FACULTY OF SCIENCE AND TECHNOLOGY
Revised Structure w.e.f. 2017-2018
Second Year B. Tech. (Civil Engineering)

Course Code	SEMESTER-III	Contact Hrs. / Week				Examination Scheme						
	Course	L	T	P	Total	CT	TH	TW	P	Total	Credits	Duration of Theory Exam
BSH201	Engineering Mathematics-III	3	1	-	4	20	80	-	-	100	4	3 Hrs.
CED202	Surveying-I	4	-	-	4	20	80	-	-	100	4	3 Hrs.
CED203	Fluid Mechanics-I	4	-	-	4	20	80	-	-	100	4	3 Hrs.
CED204	Strength of Materials	3	1	-	4	20	80	-	-	100	4	3 Hrs.
CED205	Civil Engineering Materials	4	-	-	4	20	80	-	-	100	4	3 Hrs.
CED206	Building Planning & Drawing-I	2	-	-	2	10	40	-	-	50	2	2 Hrs.
CED221	Lab I: Surveying –I	-	-	2	2	-	-	25	25	50	1	
CED222	Lab II: Fluid Mechanics-I	-	-	2	2	-	-	25	25	50	1	
CED223	Lab III: Strength of Materials	-	-	2	2	-	-	25	25	50	1	
CED224	Lab IV: Civil Engineering Materials	-	-	2	2	-	-	50		50	1	
BSH225	Lab V: Development of Skills II			2	2			50		50	1	
	Total of Semester-III	20	2	10	32	110	440	175	75	800	27	
Course Code	SEMESTER-IV	Contact Hrs. / Week				Examination Scheme						
	Course	L	T	P	Total	CT	TH	TW	P	Total	Credits	Duration of Theory Exam
BSH251A	Engineering Mathematics-IV	3	1	-	4	20	80	-	-	100	4	3 Hrs.
CED252	Surveying-II	4	-	-	4	20	80	-	-	100	4	3 Hrs.
CED253	Fluid Mechanics-II	4	-	-	4	20	80	-	-	100	4	3 Hrs.
CED254	Theory of Structure-I	3	1	-	4	20	80	-	-	100	4	3 Hrs.
CED255	Building Planning & Drawing-II	2	-	-	2	10	40	-	-	50	2	2 Hrs.
CED291-293	Programme Elective - I	4	-	-	4	20	80	-	-	100	4	3 Hrs.
CED271	Lab VI: Surveying-II	-	-	2	2	-	-	25	25	50	1	
CED272	Lab VII: Fluid Mechanics-II	-	-	2	2	-	-	25	25	50	1	
CED273	Lab VIII : Building Construction & Planning-II	-	-	2	2	-	-	25	25	50	1	
CED274	Lab IX: Computation Lab	-	-	2	2	-	-	50	-	50	1	
CED275	Lab X: DOS-III GIS Lab	-	-	2	2	-	-	50	-	50	1	
	Total of Semester-IV	20	2	10	32	110	440	175	75	800	27	
	Grand Total of III & IV									1600	54	

L: Lecture hours per week T: Tutorial hours per week P: Practical hours per week CT: Class Test
 TH: University Theory Examination TW: Term Work P: Practical/Oral Examination

Programme Elective-I

CED291: Advanced Civil Engineering Materials
 CED292: Domestic application in Fluid Mechanics

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Engineering & Technology) Syllabus of S. Y. B. Tech. (All) Semester-III</p>	
<p>Course Code: BSH201 Teaching Scheme: 04Hrs/week Theory: 03Hrs/week Tutorial: 01Hr/week Credits:04</p>	<p>Course: Engineering Mathematics –III Class Test: 20marks Theory Examination (Duration): 03 Hrs Theory Examination (Marks): 80</p>
Objectives	<p>: 1. The contents aims to develop and apply the knowledge of the student in the direction of solving the practical problem of differential equation in the engineering and technology.</p> <p>2. To develop Logical understanding of statistics.</p> <p>3. To study the basic of Laplace transform.</p>
Unit-I	<p>: Linear Differential Equation: Solution of linear differential equation of order n with constant coefficients: The complementary function, Method of finding particular integral: Short method, General method, Method of variation of parameters. Equations reducible to linear equations with constant coefficients: i) The Cauchy's linear equation. ii) The Legendre's linear equation. (10 Hrs)</p>
Unit-II	<p>: Application of linear differential equations to: i) Mechanical system. ii) Electrical System iii) Beam and Shafts (04 Hrs)</p>
Unit-III	<p>: Vector Differentiation: Differentiation of vectors, Radial, Transverse, Normal and tangential components of velocity and acceleration, Scalar and vector point function, Gradient of scalar point function, Divergence and curl of vector point function, Second order differentiation operator, Irrotational and solenoid fields. (10 Hrs)</p>
Unit-IV	<p>: Laplace Transform: Definition, Laplace Transform of elementary function and its table, Theorem and properties of Laplace Transform: First shifting theorem, Second Shifting Theorem, Multiplication by t, Division by t, Change of scale property, Laplace Transform of integral, Laplace Transform of Derivative. Laplace Transform of some special functions: Periodic function, Heaviside Unit Step Function, Displaced Heaviside Unit Step Function Laplace Transform using Heaviside Unit function, Dirac delta function. Method to find inverse Laplace Transform: i. Use of Laplace Transform table ii. Use of Theorem and properties of Laplace iii. Use of partial fraction iv. Convolution theorem v. Use of development of Heaviside Unit Step Function Application of Laplace Transform to solve linear differential equation (12 Hrs)</p>

Unit-V	:	Fourier Transform: Fourier integral: Complex form of Fourier integral, sine and cosine integral, Fourier transform and inverse transform. D.U.I.S. rule (only statement), Fourier transform and inverse transform for even and odd function, Fourier sine and cosine transform and inverse transform. (7 Hrs)
Unit-VI	:	Statistics: Measures of central tendency: Mean, Median, Quartiles and Mode. Measures of dispersion: Quartile deviation, Mean deviation, Standard deviation, coefficient of variation. (5 Hrs)
Reference Books:	:	<ol style="list-style-type: none"> 1. A Text Book of Applied Mathematics Volume-III by P.N. Wartikar J.N.Wartikar, Pune VidyarthiGrihaPrakashan. 2. Advanced Engineering Mathematics by H. K. Dass, S. Chand and Co. Ltd. 3. Higher Engineering Mathematics by Dr. B. S. Grewal, Khanna Publishers. 4. Higher Engineering Mathematics by B. V. Ramana, Tata McGraw-Hill Publishing Co. Ltd. 5. Solution to Higher Engineering Mathematics Volume –III by C. P. Gandhi

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-III (2017-18)</p> <p>Course Code: CED202 Course: Surveying – I Teaching Scheme: Theory: 4 hrs./week</p> <p align="right">Credits: 4 Class Test: 20 marks Theory Examination (Marks): 80 marks Theory Examinations (Duration): 3 hrs.</p>	
Objectives	A knowledge of surveying trains ability of engineers to visualize, think logically and pursue the engineering approach and therefore desirable as an integral part of engineering education and training, irrespective of the branch specialization
Unit I	<p>Introduction: Basic definitions, objectives and importance of surveying to engineers, concept of scale, difference between map and plan; classification and principles of surveying; overview on land surveying: ranging, chaining, traversing, triangulation.</p> <p align="right">(06 h)</p>
Unit II	<p>Linear and Angular measurements a) Linear measurements- methods, instruments for measurement of distance chaining on level ground, direct and indirect method on sloped ground, errors in chaining; offsetting, instruments for laying offsets, cross staff errors b) Angular measurements- Concept of bearing, meridian and their types, construction and use of prismatic compass, Bearings, local attraction and correction to bearings, graphical method of adjustment, errors</p> <p align="right">(08 h)</p>
Unit III	<p>Leveling and Contouring: a) Leveling – Definitions, different types (dumpy, IOP & digital) and their salient parts, temporary adjustment, principle of levelling, reduction of levels, classification of leveling b) Contouring- Definition, characteristics, uses, methods of locating contours, use of topo-sheets, profile leveling and cross-sectioning and their applications.</p> <p align="right">(08 h)</p>
Unit IV	<p>Plane table surveying – Basic definitions, instruments, orientation, methods of plane tabling, two point and three point problems in plane tabling advantages and disadvantages, setting of instruments, methods, errors, precautions: computation of area and volume: Trapezoidal and Simpsons Rule</p> <p align="right">(06 h)</p>
Unit V	<p>Theodolite traversing and Tachometry: a) Theodolite- Basic definitions and terms, different types (transit and digital) and their salient parts, temporary and permanent adjustments, measurement of horizontal and vertical angle, errors and mistakes in theodolite. b) Theodolite traversing- Computation of consecutive and independent coordinates, adjustment of a closed traverse, gale's traverse table, omitted measurements, area by coordinates c) Tachometry—Introduction, instruments, methods, principle of stadia method, determination of tachometric constants, analytic lens, horizontal and inclined sights with vertical staff.</p> <p align="right">(12 h)</p>

Unit VI	Engineering Survey: General requirements and specification for engineering projects surveys for highway, railway and canals, layout of culvert, canal, bridges and building. Tunnel survey- correlation of underground and surface survey, shafts. Hydrographic survey- shore line survey, river survey, soundings, equipments, methods of locating soundings, three point problems. (08 h)

	Sr. No.	Title	Author	Publication	Edition
Reference books	1	Surveying vol. I	S.K. Duggal	Tata McGraw Hill	3 rd
	2	Surveying vol. I	B.C. Punmia	Laxmi Publications	5 th
	3	Surveying vol. I	Kulkarni, Kanetkar	PVG Pune	17 th
	4	Plane Surveying	David Clark	Tata McGraw Hill	3 rd
	5	Surveying	Norman Thomas	Tata McGraw Hill	2 nd

Section A-Unit I, II, III Section B- Units IV, V, VI

Pattern of Question Paper: -

The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively. Question paper shall be set having two sections A & B. Section A question shall be on first part & section question on second part. Question paper should cover entire syllabus.

For 80 marks paper: -

1. Minimum ten questions.
2. Five question in each section.
3. Question No.1 from section A & Question No. 6 from section B made compulsory & should cover complete syllabus of the respective section& should be set for ten marks each. The question No.1 & 6 should be of objective nature.
4. Two question of 15 marks from each remaining question, from each section A & B asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-III (2017-18)</p> <p>Course Code: CED203 Course: Fluid Mechanics -I Teaching Scheme: Theory: 4 hrs./week</p> <p align="right">Credits:4 Class Test: 20 marks Theory Examination (Marks): 80 Marks Theory Examinations (Duration): 3 hrs.</p>	
Objectives	The subject of Fluid Mechanics is an interdisciplinary subject. For a civil engineer, it is mostly related with water. After the study of this subject, the student should be able to apply the concepts to civil engineering.
Unit I	<p>Introduction</p> <p>a) Scope, Relevance of Fluid Mechanics, Properties of Fluids, Viscosity, Rheology, Ideal Real Fluids, Newtonian and Non-Newtonian fluids, Classification of fluids, Simple Numerical</p> <p>b) Dimensions of physical quantities, dimensional homogeneity, dimensional analysis using Buckingham's π theorem method, geometric kinematic and dynamic similarity, important dimensionless parameters, Reynold's No., Froude No. and their significance.</p> <p align="right">(08 h)</p>
Unit II	<p>Fluid Statics</p> <p>a) Basic equation of Hydrostatics, concept of pressure head, measurement of pressure (Absolute, Gauge), application of the basic equation of hydrostatics, simple manometers, differential manometers and precision manometers. Introduction to pressure transducers. Centre of pressure, Total Pressure on plane and curved surfaces, Pressure Diagrams, practical applications.</p> <p>b) Principle of floatation and buoyancy, equilibrium of floating bodies, stability of floating bodies. Metacenter and metacentric height and its determination (experimental & analytical). Relative Equilibrium, uniform linear acceleration, Rotation about vertical axis.</p> <p align="right">(10 h)</p>
Unit III	<p>Fluid Kinematics</p> <p>Fluid in motion, Schools of thoughts of fluid motion, classification of fluid flow, Steady, Unsteady, Uniform, Non-Uniform, Laminar, Turbulent, Rotational, Irrotational flows, Flow net, Applications of flow net, Velocity Potential, Stream Function. Velocity, acceleration, free and forced vortex flow, radial flow</p> <p align="right">(08 h)</p>
Unit IV	<p>Fluid Dynamics</p> <p>Forces acting on fluids in motion, Euler's equation of motion, Cartesian co-ordinates along streamline. Bernoulli's equation, Momentum equation, Kinetic and Momentum correction factors (08h)</p>
Unit V	<p>Viscous Flow</p> <p>Relation between shear stress and pressure gradient, steady laminar flow through circular pipes, Hagen Poiseuille's equation, Laminar flow through inclined pipes.</p> <p align="right">(10 h)</p>

Unit VI	Measurement of Flow: Various instruments used for measuring flow like Venturimeter, Pitot tube. Orifices and Mouthpieces, Notches and Weirs. (04 h)
----------------	--

	Sr.No.	Title	Author	Publication	Edition
Reference Books	1	Hydraulics and Fluid Mechanics	Modi and Seth	Standard Book House	14 th
	2	Fluid Mechanics and Hydraulic Machines	R. K. Bansal	Laxmi Publications	4 th
	3	Fluid Mechanics and Hydraulic Machines	S. Ramamrutham	Dhanpatrai Publications	8 th
	4	Fluid Mechanics	V. L. Streeter & E. B. Wylie	TMH	3 rd

Section A-Unit I, II, III Section B-Unit IV, V, VI

Pattern of Question Paper: -

The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively. Question paper shall be set having two sections A & B. Section A question shall be on first part & section question on second part. Question paper should cover entire syllabus.

For 80 marks paper: -

1. Minimum ten questions.
2. Five question in each section.
3. Question no1 from section A & Question no 6 from section B made compulsory & should cover complete syllabus of the respective section& should be set for ten marks each. The question No.1 & 6 should be of objective nature.
4. Two question of 15 marks from each remaining question, from each section A & B asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-III (2017-18)</p> <p>Course Code: CED204 Course: Strength of Materials Teaching Scheme: Theory: 3 hrs. /week Tutorial: 1hr/week</p> <p align="right">Credits: 4 Class Test: 20 marks Theory Examination (Marks): 80 marks Theory Examinations (Duration): 3hrs.</p>	
Objectives	The purpose of the subject of Strength of Materials is to make the students aware of the limiting values of stresses, Various types of stresses acting on materials and various mechanical properties of materials.
Unit I	<p>a) Simple Stresses and strains: Mechanical properties of materials, Simple stress and strain, Stress-Strain Curve for Steel, Hooke's Law, Shearing Stresses, Bearing stresses, Composite sections, Statically Indeterminate Members, temperature stresses, lateral strains and linear strains, elastic constants, biaxial and triaxial deformations</p> <p>b) Thin cylindrical and spherical shells: Thin pressure vessels, circumferential and longitudinal stresses</p> <p align="right">(10 h)</p>
Unit II	<p>Shear Force and Bending Moment: Concept, relation between load intensity, shear force and bending moments, Shear force and bending moment diagrams for statically determinate beams subjected to various loading conditions</p> <p align="right">(08 h)</p>
Unit III	<p>Torsion: Concept, Assumptions, Derivation of torsional formulae, torsion of circular shafts, stresses in determinate solid/hollow homogeneous/composite shafts.</p> <p align="right">(06 h)</p>
Unit IV	<p>Stresses in Beams: Theory of simple bending: Pure bending, assumptions made in theory of simple bending, neutral axis, moment of resistance, section modulus, bending stress distribution diagrams for statically determinate beams with various loading conditions. Shear stresses: Shear stresses in beams, complimentary shear, shear stresses for statically determinate beams with various loading conditions.</p> <p align="right">(10 h)</p>
Unit V	<p>Columns and Struts: Concept of short and long columns, various end conditions, formulae by Euler and Rankine, Limitation of Euler's Formula, equivalent length, eccentrically loaded short compression members</p> <p>Direct and bending stresses: Bending combined with axial loads, eccentrically loaded short struts.</p> <p align="right">(08 h)</p>
Unit VI	<p>Principal stresses and strains: Concept, stress on oblique plane, two-dimensional stress system, planes of maximum shear stress, Mohr's circle diagram for principal stress.</p> <p align="right">(06 h)</p>

Reference books	Sr.No.	Title	Author	Publication	Edition
	1	Strength of Materials	S. Ramamrutham	Dhanpatrai and Sons	14 th
	2	Strength of Materials	R.K. Bansal	Laxmi Publications	4 th
	3	Mechanics of Materials	R. C. Hibbler	Pearson Education	2 th
	4	Mechanics of Structure	Junnarkar	Charotar	4 th

		Vol-I			
	5	Strength of Materials	F. L. Singer	Harper Collins	2 th

Section A-Units: I, II, III. Section B- Units: IV, V, VI.

Pattern of Question Paper: -

The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively. Question paper shall be set having two sections A & B. Section A question shall be on first part & section question on second part. Question paper should cover entire syllabus.

For 80 marks paper: -

1. Minimum ten questions.
2. Five question in each section.
3. Question No.1 from section A & Question No. 6 from section B made compulsory & should cover complete syllabus of the respective section& should be set for ten marks each. The question No.1 & 6 should be of objective nature.
4. Two question of 15 marks from each remaining question, from each section A & B asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-III (2017-18)</p>	
<p>Course Code: CED205 Course: Civil Engineering Materials Teaching Scheme: Theory: 4 hrs./week</p>	
<p>Credits:4 Class Test: 20 marks Theory Examination (Marks): 80 Marks Theory Examinations (Duration): 3 hrs.</p>	
Objectives	Concrete is one of the most commonly used building materials next to water. Objective of this subject is to make the students aware of various properties of concrete and its constituent materials as well as to have knowledge of good concrete making techniques.
Unit I	<p>Cement: Manufacturing, chemical composition, types of cement and their properties, hydration process, physical and chemical tests and standards.</p> <p>Admixtures and Construction Chemicals: Water reducers, Air entraining agents set controllers- its properties and effects on concrete properties. Introduction to supplementary cementing materials. Its production, properties and effects on concrete properties.</p> <p align="right">(10 h)</p>
Unit II	<p>Fine Aggregate: Classification, particle size distribution, fineness modulus, grading curves, specific gravity, moisture content, bulking of sand, water absorption, bulk density and standard specifications.</p> <p>Coarse Aggregate: Types, particle size distribution, fineness modulus, grading curves moisture content, specific gravity, absorption, bulk density, flakiness index, elongation index, crushing value, impact value, abrasion and attrition and standard specifications.</p> <p align="right">(10 h)</p>
Unit III	<p>Concrete production: Batching, mixing, transporting, placing, compaction, curing and finishing.</p> <p>Fresh concrete: Workability and its measurement, cohesiveness, segregation, bleeding, setting and its measurement, functioning of ready mix concrete plants.</p> <p align="right">(06 h)</p>
Unit IV	<p>Concrete Mix Design: Fundamentals of concrete mix proportioning, characteristic strength of concrete, quality control, methods of concrete mix proportioning: IS, ACI and DOE methods. Introduction to high strength concrete.</p> <p align="right">(10 h)</p>
Unit V	<p>Testing of Hardened Concrete: Compressive strength, tensile strength, modulus of elasticity and Poisson's ratio and its computation, destructive and non-destructive testing's, permeability, creep and shrinkage: measurement and parameters affecting them. Introduction to durability of concrete and factors affecting it.</p> <p align="right">(06 h)</p>
Unit VI	<p>Special concrete: Light-weight concrete, Light-weight aggregate concrete, aerated concrete. No-fines concrete, high density concrete, types of fibers, factors affecting properties of FRC and its applications.</p> <p align="right">(06 h)</p>

Reference Books	Sr.No.	Title	Author	Publication	Edition
	1	Concrete Technology	M. S. Shetty	S. Chand	2006
	2	Concrete Technology	M. L.Gambhir	Tata-McGraw Hill Book, Inc	2 nd
	3	Properties of Concrete	A. M. Navelle	Pearson Education Asia	5 th
	4	All IS Codes to testing of materials	IS Codes	IS Codes	Latest (Revised)

Section A-Unit I, II, III Section B-Unit IV, V, VI

Pattern of Question Paper:

The six units in syllabus shall be dividing in two equal parts i.e.3 units for each respectively. Question paper shall be set having two sections A & B. Section A question shall be on first part & section B question on second part. Question paper should cover entire syllabus.

For 80 marks paper:

1. Minimum Ten questions.
2. Five question in each section.
3. Question No. 1 from section A & Question No. 6 from section B made compulsory & should cover complete syllabus of the respective section& should be set for ten marks each. The question No.1 &6 should be of objective nature.
4. Two question of 15 marks each for remaining question from each section A & B to be asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-III (2017-18)</p>	
<p>Course Code: CED206 Course: Building Planning and Drawing-I Teaching Scheme: Theory: 2 hrs./week</p>	
<p>Credits:2 Class Test: 10 marks Theory Examination (Marks): 40 Marks Theory Examinations (Duration): 2 hrs.</p>	
Objective	The student should be able to conceive the civil engineering, aspects of construction of various buildings and should make their self-capable of executing various construction activities.
Unit I	<p>Substructure: Functional requirements, bearing capacity of soil and rock, necessity and concept of site investigation, setting out and layout of foundation plan, Excavation and Timbering of excavation trenches, Foundation, its function and types – shallow and deep and their suitability, Damp proof course, basement construction, plinth filling and soling.</p> <p align="right">(04 h)</p>
Unit II	<p>Superstructure I a) Types of Structures: Framed, Load bearing, Composite structures. b) Introduction to Masonry: Brick Masonry- terms, types of Bonds- English, Flemish, Header, Stretcher, Merits and Demerits Stone Masonry – types, merits and demerits, Pointing –Purpose and types. c) Arches and Lintels: Various terms in arches, types of arches, method of arch construction, types and necessity of lintels, chajja or weather shed</p> <p align="right">(04 h)</p>
Unit III	<p>Superstructure II Doors and Windows: Functional requirements, Material used for door and window, Types of door and window, fixtures and fastening</p> <p align="right">(03 h)</p>
Unit IV	<p>Superstructure III a) Flooring: functional requirement, types of flooring- ground floors, upper floors, construction details of concrete, tile, and stone flooring b) Roofing: Types of roofs, roofing materials, Flat roof and pitched roof</p> <p align="right">(05 h)</p>
Unit V	<p>Vertical Circulation: Stairs, Technical terms, Requirement of good stair, Dimensions of Step, Classification of stairs, Design Procedure. Details of ramp, lift and escalators</p> <p align="right">(05 h)</p>
Unit VI	<p>a) Shoring: Techniques for buildings, Trenches and Ships b) Underpinning: types (Mass Concrete Underpinning, Beam and base underpinning, Mini-piled underpinning, Mini-piled underpinning schemes, underpinning by expanding resin injection c) Scaffolding</p> <p align="right">(03 h)</p>

Reference Books	Sr. No.	Title	Author	Publication	Edition
	1	Building construction	B.C. Punmia	Laxmi	5 th
	2	Building Construction	SushilKumar	Khanna publishers	8 th
	3	Building Construction	BindraArrora	Dhanpatrai and Sons	10 th
	4	Building Construction(Vol. I to Vol.V)	W.B. McKay	Orient Longmann Ltd.	2 nd
	5	National building code of India SP1 ISI			

Section A- Unit I, II, III Section B- Unit IV, V, VI

Pattern of Question Paper: -The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively. Question paper shall be set having two sections A and B. Section A question shall be on first part and section question on second part. Question paper should cover entire syllabus.

For 80 marks paper: -

1. Minimum ten questions.
2. Five question in each section.
3. Question no1 from section A and Question no 6 from section B made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The question No.1 and 6 should be of objective nature.
4. Two question of 15 marks each from remaining question from each section A and B asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-III (2017-18)</p> <p>Course Code: CED221 Course: Lab I: Surveying- I Teaching Scheme: Practical / Term work: 2 hrs./ week</p> <p align="right">Credit: 1 Teachers Assessment: 25 Marks</p>					
Objectives	The objective of this subject is student should be able to understand various types of surveys related to civil Engineering.				
List of Experiments	Out of the following minimum ten experiments to be carried out 1. Chain and compass survey. 2. Measuring bearing of traverse lines, calculation of included angles and checks. 3. Study of dumpy level and reduction of levels. 4. Profile, fly, differential, and check leveling. 5. Study of planimeter, calculation of area 6. Study of abney level and clinometer 7. Study and use of plane table survey by all methods. 8. Measurement of horizontal and vertical angles by simple methods. 9. Measurement of direct, deflection angle and magnetic bearing with theodolite. 10. Study tachometer and determination of tachometer constant. 11. Determination of horizontal distance and reduced level of point by tachometric observation with horizontal and inclined line of sight of vertical staff.				
Projects	Minimum four projects to be carried out 1. Chain and compass survey. 2. Block contouring. 3. Plane table traversing. 4. Road profile. 5. Theodolite traversing.				
References Book	Sr. No.	Title	Author	Publication	Edition
	1	Surveying vol. I	S.K. Duggal	Tata McGraw Hill	3 rd
	2	Surveying vol. I	B.C. Punmia	Laxmi	5 th
	3	Surveying vol. I	Kulkarni, Kanetkar	PVG Pune	17 th
	4	Plane Surveying	David Clark	Tata McGraw Hill	3 rd
	5	Surveying	Norman Thomas	Tata McGraw Hill	2 nd

The assessment of term work shall be done based on the following:

- Continuous Assessment
- Performing the experiment given on field
- Oral examination conducted on the syllabus mentioned above

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-III (2017-18)</p> <p>Course Code: CED222 Course: Lab II: Fluid Mechanics –I Teaching Scheme: Practical / Term work: 2 hrs./ week</p> <p align="right">Credits: 1 Teachers Assessment: 25 Marks</p>					
Objectives	To understand basic properties of fluid and kinematic properties of fluid. It will develop practical approach of students.				
List of Experiments	1.Study of pressure measuring devices 2.Determination of metacentric height 3.Verification of Bernoulli's equation. 4.Callibration of Venturimeter. 5.Determination of coefficient of discharge for an orifice. 6.Determination of coefficient of discharge for a mouthpiece. 7.Callibration of rectangular notch. 8. Callibration of triangular notch. 9. Study of electrical analogy method for plotting of flow nets.				
References books	Sr.No.	Title	Author	Publication	Edition
	1	Lab. Work in Hydraulic engineering	G. L. Asawa	New Age International	1 st reprint 2011
	2	Fluid Mechanics	A.K. Upadhyay	S.K. Katariya & sons	1 st

The assessment of term work shall be done based on the following:

- Continuous Assessment
- Performing the experiment given in laboratory
- Oral examination conducted on the syllabus mentioned above

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-III (2017-18)</p> <p>Course Code: CED223 Course: Lab III: Strength of Materials Teaching Scheme: Practical / Term work: 2 hrs./ week</p> <p align="right">Credit: 1 Teachers Assessment: 25 Marks</p>					
Objectives	The purpose of the subject of Strength of Materials is to make the students aware of the limiting values of stresses, Various types of stresses acting on materials and various mechanical properties of materials				
List of Experiments	<p>Practical/Drawing/Design Term work: (Any six)</p> <ol style="list-style-type: none"> 1. Tension test on the ductile materials like mild steel and TOR steel 2. Flexural test on timber beam 3. Shear test on metals. 4. Testing on bricks-water absorption and compression. 5. Transverse test on flooring tiles. 6. Abrasion test on flooring tiles. 7. Impact tests on metals-Izod and Charpy. 8. Torsion test on steel. 9. Hardness test. <p>Assignments: Numerical examples based on</p> <ol style="list-style-type: none"> 1. Theory of simple bending 2. Deflection of beams 3. SFD and BMD. 				
References books	Sr.No.	Title	Author	Publication	Edition
	1	Strength of Materials	S. Ramamrutham	Dhanpatrai and Sons	14 th
	2	Strength of Materials	R.K. Bansal	Laxmi	4 th
	3	Mechanics of Materials	R. C. Hibbler	Pearson Education	2 th
	4	Mechanics of Structure Vol-I	Junnarkar	Charotar	4 th
	5	Strength of Materials	F. L. Singer	Harper Collins	2 th

The assessment of term work shall be done based on the following:

- Continuous Assessment
- Performing the experiment given in laboratory
- Oral examination conducted on the syllabus mentioned above

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-III (2017-18)</p> <p>Course Code: CED224 Course: Lab IV: Civil Engineering Materials Teaching Scheme: Practical / Term work: 2 hrs./ week</p> <p align="right">Credit: 1 Teachers Assessment: 50 Marks</p>					
Objectives	Objective of this lab is to make the students aware of various properties of concrete and its constituent materials as well as to have knowledge of good concrete making techniques, the student should be able to design various grades of concrete as well as they should be aware of the different techniques of testing procedure of concrete specially tests like non-destructive tests.				
List of Experiments	1. Fineness test on cement, fine aggregate and coarse aggregate 2. Consistency test on cement 3. Initial and final setting time test of cement 4. Compressive strength test on cement 5. Fineness modulus of fine aggregate and coarse aggregate 6. Bulking of sand 7. Slump test on concrete 8. Compaction factor test on concrete 9. Vee-Bee test on concrete 10. Flow table test 11. Compression test on concrete cubes 12. Rebound hammer test 13. Split tensile test 14. Mix design by any two methods				
References books	Sr. No.	Title	Author	Publication	Edition
	1	Concrete Technology	M. S. Shetty	S. Chand	2006
	2	Concrete Technology	M. L. Gambhir	Tata-McGraw Hill Book, Inc	2 nd
	3	Properties of Concrete	A. M. Navelle	Pearson Education Asia	5 th
	4	Design of Concrete Mixes	Krishna Raju	CBS Publication	4 th
	5	All IS Codes to testing of materials	IS Codes	IS Codes	Latest (Revised)
Site Visit	Minimum one site visit to study concreting operations				

The assessment of term work shall be done based on the following:

- Continuous Assessment
- Performing the experiments in laboratory
- Oral examination conducted on the syllabus mentioned above

<p align="center">Dr. BabasahebAmbedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S. Y. B. Tech. (All) Semester-III</p> <p>Course Code: BSH225 Credits:1 Course: Lab V: Development of Skills-II Teaching Scheme: Termwork: 50 marks Practical: 2 hrs/week</p>				
Objectives	1.Students will be able to apply communicative English Grammar in communication. 2.Students will be able to enhance the level of English vocabulary. 3.Students will be able to pronounce and articulate words as well as sentences accurately. 4.Students will be able to understand and apply correct body language eventually. 5.Students will be able to develop life skills. 6.Students will be able to develop placeability skills and business correspondence.			
List of Practical	Sr. No.	1. Section	2. Contents	Duration
	1	English Communicative Grammar	Structure of sentences, types of sentences, clauses, grammatical common errors in English	4 hrs
	2	Vocabulary Building	Usage of words in sentences, common errors in spelling of words, synonyms, antonyms, phrases and idioms	2 hrs
	3	Phonetics	Syllables, Stress, intonation, pronunciation of words, phonetic transcription - conversion of words to phonetic symbols and from phonetic symbols to words, British and American English (basic difference in vocabulary, spelling, pronunciation and structure), non-verbal language.	4 hrs
	4	Non-verbal Communication (Body language)	Posture, gesture, eye contact, facial expression, proxemics, chronemics, appearance and symbols.	2 hrs
	5	Soft Skills	Personality development, self analysis through SWOT, Johari window, interpersonal skills, perception and attitude, values and ethics, career planning.	2 hrs
	6	Placeability Skills	Job application, resume writing, analytical and reasoning test, debate, group discussion, demo presentation and interview skills.	4 hrs
	7	Business Correspondence	Letter writing at work place (hard copy and soft copy), telephone and Email etiquette, report writing.	2 hrs

List of Reference Books	Sr. No.	Title	Author	Publication
	1	The Essence of Effective Communication	Adrian Budday, Ron Ludlow and Fergus' Panton	Prentice Hall of India-Private Ltd.
	2	Communicating in Style	Yateendra Joshi	The energy Resource Institute
	3	Effective Technical Communication	Anne Eisenberge	McGraw Hill International Editors
	4	Professional Communication Skills	A. K. Jain, Pravin, S. R. Bhatia, A. M. Sheikh	S. Chand & Company Ltd.
	5	Business Communication	Urmila Rai, S. M. Rai	Himalya Publishing House
	6	Developing Communication Skills	Krishna Mohan and Meera Banerjee	Macmillan India Limited
	7	Better English Pronunciation	J.D.O'Connor.	Cambridge Publication
	8	Professional Communication Skill	Pravil S.R. Bhatia, S.Bhatia	S. Chand & Co
	9	Living English Structure	Allan Walter	Pearson Education India
	10	Communication Techniques & Skill	R.K. Chadha	
	11	Technical Communication- Principles and Practice	Meenakshi Raman & Sangeeta Sharma	Oxford University Press
	12	A course in Phonetics & Spoken English	J.Sethi, P.V.Dharmatma	PHI publication
	13	Communication Skills for Engineers	Sunita Mishra, C. Murli Krishna	Pearson Education
	14	Communication Skills	LeenaSen	PHI
	15	Technical Communication A Reader Centered Approach	Paul V. Anderson	Thomson Publication
	16	Grammar of Spoken and Written English	DauglasBiber, Geoffrey Leech	Longman
	17	A Practical English Grammar	A.J. Thomson & A.V. Martinet	Oxford University Press
	18	Oxford English Grammar	Sydney Greenbaum	Oxford University Press
	19	3. Developing Graduate Employability Skills: Your Pathway to Employment	Mercy V. Chaita	Universal Publishers

The assessment of term work shall be done on the basis of the following:

1. Continuous assessment.
2. Performing the experiments in the laboratory.
3. Oral examination conducted on the syllabus and term work mentioned above.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)

Course Code: BSH251A

Teaching Scheme: 04Hrs/week

Theory: 03 Hrs/week

Tutorial: 01 Hr/week

Credits: 04

Course: Engineering Mathematics -IV

Class Test: 20 marks

Theory Examination (Duration): 03 Hrs

Theory Examination (Marks): 80

Objectives	:	1) To develop the mathematical skills of the student related to Function of complex variable and Vectors. 2) To study and apply various types of transforms and partial derivatives. 3) To provide Numerical techniques for solving the practical problem in engineering and technology.
Unit-I	:	Function of complex variable : Introduction , Analytic function ,Cauchy-Riemann equation in Cartesian and polar coordinates, Harmonic function, orthogonal system, Integration in complex plane: Line integral, Contour integral, Cauchy's integral theorem, Cauchy's integral formula, Extension of Cauchy's theorem on multiply connected region, Singularities, Residues, Cauchy's residue theorem. (12 Hrs)
Unit-II	:	Application of Complex Variable: Evaluation of real integrals: Integration along unit circle and along the upper half semi-circle, Conformal Transformation, Bilinear transformation. (5Hrs)
Unit-III	:	Vector Integration: Line integral, Surface integral, Gauss divergent theorem, Stoke's theorem, Green's theorem. (7 Hrs)
Unit-IV	:	Numerical Method: Solution of algebraic and transcendental equation, Newton Raphson method, Lagrange's interpolation, Solution of linear simultaneous equation by Gauss Elimination method, Gauss-Seidel method, Solution of ordinary differential equations: Taylor series method, Fourth order Runge-Kutta method. (10 Hrs)
Unit-V	:	Probability: Introduction, Probability Distributions: Binomial Distribution, Poisson Distribution, Normal Distribution. (6 Hrs)
Unit-VI	:	Application of partial differential equation : Solution of partial differential equation by method of separation variable, Application to i. Vibration of a string (The wave equation) (without proof) ii. One dimensional heat flow (The diffusion equation) (without proof)

		iii. Two dimensional heat flow (The diffusion equation) (without proof) (8 Hrs)
Reference Books:	:	1. A Text Book of Applied Mathematics Volume-III BY P.N. Wartikar J.N.Wartikar, Pune VidyarthiGrihaPrakashan. 2. Advanced Engineering Mathematics BY H. K. Dass, S. Chand and Co. Ltd. 3. Higher Engineering Mathematics BY Dr. B. S. Grewal, Khanna Publishers. 4. Higher Engineering Mathematics BY B. V. Ramana, Tata McGraw-Hill Publishing Co. Ltd. 5. Solution to Higher Engineering Mathematics Volume –III BY C. P. Gandhi

Section A: Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED252 Course: Surveying – II Teaching Scheme: Theory: 4 hrs. /week</p> <p align="right">Credits: 4 Class Test: 20 marks Theory Examination (Marks): 80 marks Theory Examinations (Duration): 3 hrs.</p>	
Objectives	A knowledge of surveying trains ability of engineers to visualize, think logically and pursue the engineer approach and therefore desirable as an integral part of engineering education and training, irrespective of the branch specialization.
Unit I	<p>Curves: Basic definitions, different types and their characteristic, geometry, setting out, field problem on circular curve, Compound curve, reverse curve, transition curve, combined curve and vertical curve.</p> <p align="right">(12 h)</p>
Unit II	<p>Trigonometrical Levelling & Triangulation Adjustment A) Trigonometrical Levelling: Trigonometric leveling, Axis Signal correction error and mistakes in leveling, error propagation. B) Triangulation Adjustment: Definitions, weighted observations, laws of weights, station Adjustment, figure adjustment (Triangle only).</p> <p align="right">(10 h)</p>
Unit III	<p>Modern surveying Equipment: Modern surveying electronic equipments: Digital theodolites, EDM, Total station, Principle and working applications, laser in surveying, Nautical extent.</p> <p align="right">(03h)</p>
Unit IV	<p>Photogrammetry: Photogrammetry terms; applications, types of photographs, perspective geometry of near vertical and tilted photographs, height and tilt distortions, flight planning, stereoscopy, base lining, floating marks, parallax equation and stereo measurement for height determination, analogue analytical and digital method, photogrammetric instruments.)</p> <p align="right">(08h)</p>
Unit V	<p>Remote Sensing: Introduction- remote sensing system- data acquisition and processing, applications, multi concept in remote sensing, physical basis of remote sensing – Electro- magnetic radiation (EMR) – nature, nomenclature and radiation laws, interaction in atmosphere – nature, its effects in various wave length regions, atmospheric window, Interaction at ground surface – soil and rocks, vegetation, water, etc. Geometric basis of interaction, platforms and sensors – Terrestrial, Aerial and space platforms,, orbital characteristic of space platform , sun- and geo- synchronous, sensor system -radiometers, optomechanical and space broom sensor, Resolution – spectral, spatial, radiometric and temporal, data products from various air and space borne sensor – aerial photographs, LIDAR, Land sat, SPOT, IRS, ERS, IKONOS, etc. image interpretation- element of interpretation, manual and digital interpretation, field verification. (10 h)</p>
Unit VI	<p>Geographical Information System and Global Positioning System a) Global Information System (GIS): Components of GIS – Data acquisition, spatial and attribute data, pre- processing, storage and management, Data structure raster and vector data, GIS analysis functions, error and corrections, data presentation and generation of thematic maps, application. b) Global Positioning System (GPS): Introduction, Fundamental concepts, GPS</p>

	system elements and signals, GPS measurements and accuracy of GPS, Satellite Movement, GPS Satellites, Co-ordinate systems Worldwide Reference Ellipsoid, WGS 84. (05h)
--	---

	Sr. No.	Title	Author	Publication	Edition
Reference Books	1	Surveying and Levelling	N.N. Bask	Tata Mc-Graw Hill education	2 nd
	2	Surveying & Levelling	T. P. Kanetkar & S.V. Kulkarni	Laxmi Publications	1 st
	3	Surveying	B.C. Punmia & Ashok Kumar Jain	Laxmi Publication	2 nd
	3	Surveying	S.K. Duggal	Tata Mc-Graw Hill education	4 th

Section A-Unit I, II, III Section B-Unit IV, V, VI

Pattern of Question Paper:

The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively. Question paper shall be set having two sections A & B. Section A question shall be on first part & section question on second part. Question paper should cover entire syllabus.

For 80 marks paper:

1. Minimum ten questions.
2. Five question in each section.
3. Question no1 from section A & Question no 6 from section B made compulsory & should cover complete syllabus of the respective section& should be set for ten marks each. The question No.1 & 6 should be of objective nature.
4. Two question of 15 marks from each remaining question, from each section A & B asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED253 Course: Fluid Mechanics –II Teaching Scheme: Theory: 4 hrs. /week</p> <p align="right">Credits: 4 Class Test: 20 marks Theory Examination (Marks): 80 marks Theory Examinations (Duration): 3 hrs.</p>	
Objective	The objective of this subject is to widen the horizon of the subject already learnt as a basic course in the first part of it. It is also intended that the student learns the applications of the subject in form of various hydraulic machines.
Unit I	<p>Turbulent flow & Flow through Pipes a) Characteristics of flow, instantaneous velocity, temporal mean velocity, scale of turbulence and intensity of turbulence, Prandtl's mixing length theory, velocity distribution in turbulent flow. b) Flow through pipes: energy losses in pipe flow (major losses and minor losses), Darcy Weisbach Equation, variation of friction factor for laminar flow and for turbulent flow, Moody's diagram, explicit equation for friction factor, flow through pipes such as simple, compound, series parallel, branched pipes, siphon, Dupuit's equations</p> <p align="right">(08 h)</p>
Unit II	<p>Flow through open channels Classification of channels, Steady and unsteady flow in open channels, uniform and nonuniform flows, laminar and turbulent flows, gradually and rapidly varied flows. Velocity distribution in open channels. Geometric shapes of channel sections and their expressions, economic channel sections, basic equations of fluid flow i.e. continuity equation, momentum equation, Bernoulli's equation applied to channel flow, Chezy's and Manning's equations, specific energy diagrams, alternate depths, Froude number, specific force, critical flow. Non-uniform flow in channels, slope profiles, measurement of flow in channels, standing wave flume, venturiflume. hydraulic jump, energy dissipation.</p> <p align="right">(10 h)</p>
Unit III	<p>Computational Fluid Dynamics Introduction to CFD, Popular techniques (RANS, LES, DNS), methods (FEM, FVM), Applications of CFD in civil engineering: Urban planning, Fire simulation, HVAC, IAQ (Indoor air quality), Wind loading on bridges, Wave loading on off-shore structures, Fluid dynamics solvers, Boundary conditions</p> <p align="right">(08 h)</p>
Unit IV	<p>Impact of jets Dynamics of force, momentum, impulse momentum equation, jet force on stationary and moving vanes, jet propulsion, forces on reduced bends,</p> <p align="right">(06 h)</p>
Unit V	<p>Turbines Classification of turbines, impulse and reaction turbines, components and their functions, efficiency and characteristics of turbines, specific speed unit speed, unit power, unit discharge, selection criterion for turbines, cavitation, draft tube, runaway speed, surge tank</p> <p align="right">(08 h)</p>
Unit VI	<p>a) Centrifugal Pumps</p>

	<p>Components, types, construction, principle of working, efficiencies, characteristic and specific speed under various operation conditions, priming of pumps, self-priming, cavitation, multistage centrifugal pumps</p> <p>b) Reciprocating Pumps Types, working principle, indicator diagram, work done, effect of acceleration and frictional resistance, slip separation in suction and delivery pipes, air vessel and its function, multi cylinder pumps.</p> <p>c) Hydraulic ram</p> <p style="text-align: right;">(08 h)</p>
--	--

	Sr. No.	Title	Author	Publication	Edition
Reference Books	1	Hydraulics and Fluid Mechanics	Modi & Seth	Standard Book House	14 th
	2	Fluid Mechanics and Hydraulic Machines	R. K. Bansal	Laxmi Publications	4 th
	3	Fluid Mechanics and Hydraulic Machines	S. Ramamrutham	Dhanpatrai Publications	8 th
	4	Fluid Mechanics	V.L. Streeter & E.B. Wylie	TMH	3 rd

Section A-Unit I, II, III Section B-Unit IV, V, VI

Pattern of Question Paper: -

The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively. Question paper shall be set having two sections A & B. Section A question shall be on first part & section question on second part. Question paper should cover entire syllabus.

For 80 marks paper: -

1. Minimum ten questions.
2. Five question in each section.
3. Question no1 from section A & Question no 6 from section B made compulsory & should cover complete syllabus of the respective section& should be set for ten marks each. The question No.1 & 6 should be of objective nature.
4. Two question of 15 marks from each remaining question, from each section A & B asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED254</p> <p>Course: Theory of Structure-I</p> <p>Teaching Scheme:</p> <p>Theory: 3 hrs. /week</p> <p>Tutorial: 1hr/week</p> <p>Credits: 4</p> <p>Class Test: 20 marks</p> <p>Theory Examination (Marks): 80 marks</p> <p>Theory Examinations (Duration): 3 hrs.</p>					
Objective	At the end of this course, the student should be able to analyze given set of structure and loading and should arrive at most likely values of loads/ shear force/ moments to be carried out by the individual structural component.				
Unit I	Strain Energy: Strain energy due to gradually applied loads, suddenly applied loads and impact loads. (04 h)				
Unit II	Deflection of statically determinate Structures: Calculation of deflection for determinate beams by double integration, theorem of area moment method, conjugate beam method, strain energy method and Castiglione's theorem. Calculation of deflection for determinate frames and trusses by strain energy method and Castiglione's theorem, effect of temperature change. (12h)				
Unit III	Influence lines for statically determinate structures: Influence lines for reaction, Bending moment & Shearing force for cantilevers & simple and compound beams, Influence lines for forces in member of statically determinate trusses, criteria for maximum bending moments & maximum shearing force for simple determinate beams (08h)				
Unit IV	Fixed Beams: Analytical & moment area methods, Beams with different moment of inertia, effect of sinking of support Continuous Beams: Clapeyrons theorem of three moments, beams with different moment of inertia, effect of sinking of support. (12h)				
Unit V	Three Hinged Arches: Eddy's theorem, Circular, parabolic and geometric arches, concept of radial shear force and axial thrust, analysis of three hinged arches, Effect of yielding of supports, rib shortening and temperature changes, ILD for 3 hinged arches. (06h)				
Unit VI	Three Hinged Suspension Bridges: Simple suspension cable, anchor cable, suspension cable with three hinged stiffening girders, Temperature stresses in the cables. Influence lines for shear force & bending moment at a given section of stiffening girder. (06h)				
Reference books	Sr.No.	Title	Author	Publication	Edition
	1	Analysis of structure (Vol. I & II)	Vazrani & M.M. Ratwani	Standard publisher	4 th
	2	Theory of Structures	S. Ramamrutham	Dhanpatrai & Sons	10 th
	3	Theory of Structures	Timoshenko & Young	PHI	2 nd

Section A: Unit I, II, III.

Section B: Unit IV, V, VI.

Pattern of Question Paper:

The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively. Question paper shall be set having two sections A & B. Section A question shall be on first part & section question on second part. Question paper should cover entire syllabus.

For 80 marks paper:

1. Minimum ten questions.
2. Five question in each section.
3. Question no1 from section A & Question no 6 from section B made compulsory & should cover complete syllabus of the respective section& should be set for ten marks each. The question No.1 & 6 should be of objective nature.
4. Two question of 15 marks from each remaining question, from each section A & B asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED255 Course: Building Planning and Drawing-II Teaching Scheme: Theory: 2 hrs./wee</p> <p align="right">Credits: 2 Class Test: 10 marks Theory Examination (Marks): 40 Marks Theory Examinations (Duration): 2 hrs.</p>					
Objective	After this course of the syllabus, the student should be able to design various buildings functionally and he should also be able to transfer the ideas in his mind onto the paper through the universal language of engineers i.e. drawing.				
Unit I	Principles of planning- orientation, aspect, prospect, Grouping, functional requirement of different unit's roominess flexibility space utilization, Planning of living area, Sleeping area, Service area, and circulation. (05 h)				
Unit II	Line plans, working drawing and submission plan to sanctioning authorities for Residential Building. (04h)				
Unit III	Checklist for planning a building project, site plan, utilities and services, legal documents, budget restrictions. (03 h)				
Unit IV	Perspective Drawing- concept, general principles of perspective drawing, one point & two-point perspective for buildings. (05h)				
Unit V	Functional design of buildings based on the various requirements for residential & public buildings. (04 h)				
Unit VI	Educational, industrial offices, hospitals, banks, libraries, hostels, markets, post office, railway stations, central bus stand, airports, apartments etc. fixing, wall papering and glazing work. (03 h)				
Reference Books	Sr.No.	Title	Author	Publication	Edition
	1	Planning & Designing of buildings	Y.S. Sane	PVG Prakashan, Pune	3 rd
	2	Principles of Perspective Drawing	M.G. Shah & C.M. Kale	TMH	6 th
	4	Handbook on functional requirements of buildings (SP: 41)	BIS	BIS	2 nd
	5	A text book on perspective sciography	Shankar Mulik	Allied Publishers	1 st

Section A-Unit I, II, III Section B-Unit IV, V, VI

Pattern of Question Paper:

The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively. Question paper shall be set having two sections A & B. Section A question shall be on first part & section question on second part. Question paper should cover entire syllabus.

For 40 marks paper:

1. Minimum ten questions.
2. Five question in each section.
3. Question No 1 from section A & Question No 6 from section B made compulsory & should cover complete syllabus of the respective section& should be set for ten marks each. The Question No.1 & 6 should be of objective nature.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED291 Course: Elective- I - Advanced Civil Engineering Credits: 4 Materials Class Test: 20 marks Theory Teaching Scheme: Examination (Marks): 80 Marks Theory: 4 hrs./week Theory Examinations (Duration): 3 hrs.</p>	
Objectives	There are many new emerging advanced building materials which show better improvement in the material properties over the conventional building materials and consequently the properties of the composite materials. Objective of this subject is to make the students aware of various types and properties of advanced materials as well as to have knowledge of applications to the civil engineering structures.
Unit I	<p>Introduction: General, hydration of cement, alkali aggregate reaction. Grading curves of aggregates, manufactured sand as fine aggregate, copper slag as fine aggregate.</p> <p>Concrete: Properties of concrete, w/b ratio, gel space ratio, problems on maturity concept, aggregate cement bond strength, green concrete, guidelines for quality control and quality assurance of concrete, effect of admixtures.</p> <p align="right">(08 h)</p>
Unit II	<p>Structural Light weight concrete, ultra-light weight concrete, vacuum concrete, mass concrete, waste material based concrete, sulphur concrete and sulphur infiltrated concrete, jet cement concrete (ultra-rapid hardening), gap graded concrete, high strength concrete, high performance concrete, self-curing concrete, pervious concrete.</p> <p align="right">(08 h)</p>
Unit III	<p>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, design of pump able concrete mixes, design of self-compacting concrete.</p> <p>Advanced non-destructive testing methods: ground penetration radar, probe penetration, break off maturity method, stress wave propagation method, electrical/magnetic methods, nuclear methods and infrared thermographs.</p> <p align="right">(10 h)</p>
Unit IV	<p>Historical development of fibre reinforced concrete, properties of metallic fibre, polymeric fibers, carbon fibers, glass fibers and naturally occurring fibers. Interaction between fibers and matrix (uncracked and cracked matrix), basic concepts and mechanical properties: tension and bending.</p> <p align="right">(07 h)</p>
Unit V	<p>Properties of hardened FRC, behavior under compression, tension and flexure of steel fibers and polymeric fibers, GFRC, SFRC, SIFCON, development, constituent materials, casting, quality control tests and physical properties.</p> <p align="right">(07 h)</p>
Unit VI	<p>Ferro cement: Properties and specifications of ferro cement materials, analysis and design of prefabricated concrete structural elements, manufacturing process of industrial concrete elements, precast construction, erection and assembly techniques.</p> <p>Formwork: Introduction, types of formworks, its components, conventional formworks, advanced formwork solutions, Mivan shuttering, tunnel formwork, area computation.</p> <p align="right">(08 h)</p>

Reference books	Sr. No.	Title	Author	Publication	Edition
	1	Concrete Technology	M. S. Shetty	S. Chand	2006
	2	Concrete Technology	M. L. Gambhir	Tata-McGraw Hill Book, Inc	2 nd
	3	Concrete Technology	A.R. Santhakumar	Oxford University Press	Latest
	4	Properties of Concrete	A. M. Navelle	Pearson Education Asia	5 th
	5	Fiber Reinforced Cement Composite	P.N. Balguru and P.N. Shah	Tata-McGraw Hill Book, Inc	1992
	6	Concrete: Microstructure, Properties and Materials	P. Kumar Mehta and P. S. M. Monteiro	Tata-McGraw Hill Book, Inc	Latest
	7	Concrete Mix Design	N Krishna Raju	UBS Publishers and Distributors	Jan 2014
	8	Indian Practical Civil Engineers Handbook	P. N. Khanna	UBS Publishers and Distributors	Jan 2012
	9	MFE formwork technology	MFE	www.mfeformwork.com	Website
	10	All IS Codes to testing of materials	IS Codes	IS Codes	Latest (Revised)

Section A-Unit I, II, III Section B-Unit IV, V, VI

Pattern of question paper: -

The six units in syllabus shall be dividing in two equal parts i.e. three units for each respectively. Question paper shall be set having two sections i.e. sections-A and section-B. Section-A question shall be on first part and section-B question on second part. Question paper should cover entire syllabus.

For 80 marks paper: -

1. Minimum Ten questions.
2. Five question in each section.
3. Question No. 1 from section-A and Question No. 6 from section-B made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The question No.1 and 6 should be of objective nature.
4. Two questions of 15 mark each for remaining question from each section-A and section-B to be asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED292</p> <p>Course: Elective- I- Domestic Applications of Fluid Mechanics</p> <p>Teaching Scheme: Theory: 4 hrs./week</p> <p>Credits: 4 Class Test: 20 marks Theory Examination (Marks): 80 Marks Theory Examinations (Duration): 3 hrs.</p>	
Objectives	<p>To empower student to design and develop simple water related model or instrument</p> <p>To develop skill among student to identify and rectify problems in working of domestic instrument</p>
Unit I	<p>Amount of rain, rain cycle, calculation of rainfall, rainfall measurement, working of raingauges, expression of rainfall in various unit, design of simple rain guage.</p> <p align="right">(08h)</p>
Unit II	<p>Awareness about hydraulic structure, various river basin, conservation of water quality in various unit, river training works, layout of water supply scheme.</p> <p align="right">(08 h)</p>
Unit III	<p>Types of filter, working of small domestic filter, repair and working of filter, design of small filter for your home.</p> <p align="right">(08h)</p>
Unit IV	<p>Develop ship model to demonstrate the property of buoyancy/buoyant force and various equilibrium condition.</p> <p align="right">(08h)</p>
Unit V	<p>Types of various pipe fitting applicable in domestic fields, working and selection of pumps, calculation of energy used under different load condition, operation of valves and pump water discharged for valve manualing calculation.</p> <p align="right">(08 h)</p>
Unit VI	<p>Hands on training on various topics mentioned in previous units, Roof top rainwater harvesting to recharge groundwater, Hands on training to maintenance of pumps, filter valves and softener</p> <p align="right">(08h)</p>

	Sr.No.	Title	Author	Publication
Reference books	1	Hydrology	P. Jaya Rami Reddy	Laxmi publications
	2	Water and waste water treatment		Dhanpatrai Publications
	3	Hydraulics and Fluid Mechanics	Modi and Seth	Standard Book House
	4	IGBC manual		

Section A-Unit I, II, III Section B-Unit IV, V, VI

Pattern of question paper: -

The six units in syllabus shall be dividing in two equal parts i.e. three units for each respectively. Question paper shall be set having two sections i.e. sections-A and section-B. Section-A question shall be on first part and section-B question on second part. Question paper should cover entire syllabus.

For 80 marks paper: -

1. Minimum Ten questions.
2. Five question in each section.
3. Question No. 1 from section-A and Question No. 6 from section-B made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The question No.1 and 6 should be of objective nature.
4. Two questions of 15 mark each for remaining question from each section-A and section-B to be asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p>	
<p>Course Code: CED293 Credits:4 Course: Elective- I - Building Maintenance Class Test: 20 marks Teaching Scheme: Theory Examinations (Duration): 3 hrs. Theory: 4 hrs./week Theory Examination (Marks): 80 Marks</p>	
Objective	The student should be able to conceive the civil engineering, aspects of maintenance of various buildings and should make their self-capable of executing various maintenance activities.
Unit I	<p>Protective coatings: Plastering types and application, Painting and varnishing- types and application; White washing, distempering, oil paints; Wall cladding – materials, methods of fixing, wall papering and glazing work</p> <p>Dam proofing- Sources, causes of dampness in buildings, ill effects of dampness, Methods of damp proofing</p> <p align="right">(08 h)</p>
Unit II	<p>a) Water proofing – Causes and effects of water leakages, Methods of water proofing, Materials used for waterproofing</p> <p>b) Termite proofing – Types of termites, Anti termite treatment, Methods</p> <p>c) Fire protection – Fire hazards, Fire load grading of structural Elements, grading of building, Characteristic of fire proofing material, general fire safety requirements of buildings, Thermal insulation, Methods of thermal insulation, IS specification</p> <p align="right">(10 h)</p>
Unit III	<p>a) Acoustics and sound insulation – Characteristic and behavior of Sound, Reflection and reverberation of sound, Absorption of sound, Acoustical defects, IS specification, Acoustical design of halls</p> <p>b) Ventilation and air conditioning – System of ventilation, essential of comfort air conditioning and system of air conditioning.</p> <p align="right">(06 h)</p>
Unit IV	<p>Plumbing Fixtures and Fixture Fittings- Definitions of Plumbing Terminologies. Plumbing fixtures, water conserving fixtures, water closets, bidets, urinals, flushing devices, lavatories, bath/shower, kitchen sinks, water coolers, drinking fountain, clothes washer, mop sink, overflows, strainers, prohibited fixtures, installation standards, strainers, floor drains, floor slopes, location of valves, hot water temperature, and table of minimum plumbing facilities.</p> <p align="right">(08 h)</p>
Unit V	<p>Traps and Interceptors- Traps required, trap arms, developed length, trap seals, venting to traps, trap primers, prohibited traps, building traps, clarifiers, grease interceptors, sizing, FOG disposal, oil and sand interceptors.</p> <p>Indirect Waste - Air-gap, food establishments, sink traps, dish washers, drinking fountains, waste receptors, sterile equipment, appliances, condensers, chemical wastes, point of discharge, venting. Introduction to pipe sizing.</p> <p>Vents - Vent requirement, trap seal protection, materials, vent connections, flood rim level, termination, vent stacks, water curtain and hydraulic jump, horizontal and vertical wet venting, combination waste and vent system, cleanouts, venting of interceptors. Introduction to vent sizing, sizing of combination vents etc.</p> <p align="right">(10 h)</p>
Unit VI	<p>Plumbing in High rise- Buildings definition of high rise, multiple storage tanks, plumbing shafts, break pressure tank, water supply, hydro-pneumatic system, pressure reducing valves, building drainage system, rainwater system, sizing, testing, case study.</p>

	introduction to centralized hot water supply, system types, principle of design, pressure conditions, insulation, return circulation, sizing, testing. (06 h)
--	--

	Sr. No.	Title	Author	Publication	Edition
Reference Books	1	Building construction	B.C. Punmia	Laxmi	5 th
	2	Building Construction	Sushil Kumar	Khanna publishers	8 th
	3	Building Construction	BindraArrora	Dhanpatrai&Sons	10 th
	4	Uniform Plumbing Code- India (UPC-I), 2008			
	5	National building code of India SP1 ISI			

Section A-Unit I, II, III Section B-Unit IV, V, VI

Pattern of Question Paper:

The six/four units in syllabus shall be divide in two equal parts i.e.3 units respectively. Question paper shall be set having two sections A & B. Section A question shall be on first part & section question on second part. Question paper should cover entire syllabus.

For 80 marks paper:

1. Minimum ten questions.
2. Five question in each section.
3. Question no1 from section A & Question no 6 from section B made compulsory & should cover complete syllabus of the respective section& should be set for ten marks each. The question No.1 & 6 should be of objective nature.
4. Two question of 15 marks each from remaining question from each section A & B asked to solve.

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED271 Course: Lab –VI: Surveying- II Teaching Scheme: Practical / Term work: 2 hrs. / week</p> <p align="right">Credit: 1 Teachers Assessment: 25 Marks</p>						
Objectives	The objective of this subject is student should be able to Understand various types of surveys related to civil Engineering.					
List of Experiments	<ol style="list-style-type: none"> 1. Study of one second theodolite. 2. Measurement of horizontal and vertical angle by one second theodolite. 3. Satellite station and reduction center. 4. Study of Total Station (Distance, Gradient, Height Between two objects of accessible points 5. Study of Electronic distance meter. 6. Study of Mobile mapping using GPS Essentials. 7. Digitizing of map using QGIS and Google earth. 					
Projects	Minimum three <ol style="list-style-type: none"> 1. Setting out of building. 2. Setting out simple curve by offset long chord method. 3. Setting out simple curve by offset from chord produced. 4. Setting out simple curve by offset from Rankine's method. 5. Setting out traverse by using Total station. 6. Setting out of contours using total station. 					
Reference Books	Sr. No.	Title	Author	Publication	Edition	
	1	Surveying Vol. II	S.K. Duggal	Tata McGraw Hill	3 rd	
	2	Surveying Vol. II	Dr. B.C. Punmia	Laxmi	5 th	
	3	Surveying Vol. II	Kulkarni, Kanetkar	PVG Pune	17 th	
	4	Plane Surveying	David Clark	Tata McGraw Hill	3 rd	
	5	Surveying	Norman Thomas	Tata McGraw Hill	2 nd	

The assessment of term work shall be done based on the following:

- Continuous Assessment
- Performing the experiment given in field
- Oral examination conducted on the syllabus mentioned above

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p>					
<p>Course Code: CED272 Course: Lab VII: Fluid Mechanics-II Teaching Scheme: Practical / Term work: 2 hrs./ week</p>					
<p align="right">Credit: 1 Teachers Assessment: 25 Marks</p>					
Objectives	This set of experiments acquainted losses in conduit flow & open channel flow. They will be able to predict the results of open channel flow & hydraulic machines.				
List of Experiments	1.Determination of Chezy's and Manning's constants 2.Determination of co-efficient of discharge for venturi-flume /standing wave flume 3. Determination of pipe friction factor. 4. Determination of minor losses. 5.Study of hydraulic jump. 6.Impact of Jet. 7.Trial on turbine. 8. Trial on centrifugal pump. 9. Trial on reciprocating pump. 10.Study of hydraulic ram. 11. Demo on CFD application				
Reference books	Sr. No.	Title	Author	Publication	Edition
	1	Lab. Work in Hydraulic engineering	G.L. Asawa	New Age International	1 st reprint 2011
	2	Fluid Mechanics	A.K. Upadhyay	S.K. Katariya & sons	1 st

The assessment of term work shall be done based on the following:

- Continuous Assessment
- Performing the experiment given in Laboratory
- Oral examination conducted on the syllabus mentioned above

<p align="center">Dr. BabasahebAmbedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED273 Course: LabVIII: Building Planning & Drawing -II Teaching Scheme: Practical / Term work: 2 hrs./ week</p> <p align="right">Credit: 1 Teachers Assessment: 25 Marks</p>						
Objective	The objective of this subject is student should be able to draw various types of sheets related to building planning & designing phase.					
List of Sheets	<ol style="list-style-type: none"> 1. Line plan of 2 Rooms & 3 Rooms. (Graph Paper) 2. Line plan of 1 BHK & 2 BHK Apartment/ Flat. (Graph Paper) 3. Submission Drawing of Bungalow with 5 rooms. 4. Submission Drawing of Bungalow with 7 rooms G+1 (Using CAD) 5. Measure drawing including site visit 6. Working drawing of 1 public building using CAD 7. Perspective drawing of 2 rooms residential building having chajja projection & steps at entrance. 8. To prepare 3 rooms building drawing in 3 D using CAD 					
Site Visit	Minimum one site visit required to draw measured drawing.					
References books	Sr.No	Title	Author	Publication	Edition	
	1	Planning & Designing of buildings	Y.S. Sane	PVG Prakashan, Pune	3 rd	
	2	Principles of Perspective Drawing	M. G. Shah& C.M. Kale	TMH	6 th	

The assessment of term work shall be done based on the following:

- Continuous Assessment
- Performing the experiment given in Laboratory
- Oral examination conducted on the syllabus mentioned above

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED274 Course: Lab IX: Computation Lab Teaching Scheme: Practical / Term work: 2 hrs./ week</p> <p align="right">Credit: 1 Teachers Assessment: 25 Marks</p>					
Objective	To develop skill among student to frame programmes in any language for basic civil engineering application				
List of Programmes	<p>A. To write and run programme for discharge measurement</p> <ol style="list-style-type: none"> 1. Continuity equation 2. Discharge measurement through: venturimeter, orificemeter, mouthpiece, notch, weir and orifice 3. Frictional losses- head loss through pipe <p>B. To write and run programme for applications in strength of materials</p> <ol style="list-style-type: none"> 1. SF calculation under different conditions 2. BM calculations under different conditions 3. To find the poisson's ratio for any material <p>C. To write and run programme for applications in Concrete Technology</p> <ol style="list-style-type: none"> 1. Mix design of concrete 2. Quantity of cement, sand, water for any grade of cement 				
References books	Sr. No.	Title	Author	Publication	Edition
	1	Planning & Designing of buildings	Y.S. Sane	PVG Prakashan, Pune	3 rd
	2	Principles of Perspective Drawing	M.G. Shaha & C.M. Kale	TMH	6 th

The assessment of term work shall be done based on the following:

- Continuous Assessment
- Performing the experiment given in Laboratory
- Oral examination conducted on the syllabus mentioned above

<p align="center">Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Science & Technology) Syllabus of S.Y. B. Tech Civil Semester-IV (2017-18)</p> <p>Course Code: CED275 Course: Lab X: DOS-III GIS Lab Teaching Scheme: Practical / Term work: 2hrs./ week</p> <p align="right">Credit: 1 Teachers Assessment: 25 Marks</p>				
Objective	To develop skill among student to digitize and analyse map of any study area for various civil engineering applications			
List of Exercise	<ol style="list-style-type: none"> 1. Introduction to QGIS and data collection for GIS 2. Projection and re-projection and geo-referencing the image in QGIS 3. Steps in geo-referencing the image in QGIS for study area 4. Steps in digitizing the raster Image in QGIS for study area 5. Map Preparation in QGIS 6. Steps in urban spatial analysis and spatial query in QGIS 7. Steps in watershed delineation of study area in QGIS 8. Take any topology map from government department and digitized the image in QGIS 9. Prepare the flood mapping for kham river in aurangabad region using QGIS 10. Download the any study area of (100 sq.km) in maharashtra from resource and prepare the watershed delineation using GRASS Plugins 11. Download the any study area of (100 Sq.km) in maharashtra from resource and prepare the watershed delineation using SWAT Plugins 			
Reference books	Sr. No.	Title	Author	Publication
	1	Geographic Information Systems: A Management Perspective	Arnoff S.	WDL Publications, Canada
	2	Training Manual "GIS for Civil Engineers"	Dr. Raaj Ramsankaran IIT Bombay	TMH
	3	An Introduction to Geographical Information Systems	Heywood I., Cornelius S. and Carver S.	Longman Publishers

The assessment of term work shall be done based on the following:

- Continuous Assessment
- Performing the experiment given in Laboratory
- Oral examination conducted on the syllabus mentioned above