SYLLABUS

Of

T. Y. B.Tech. Civil Engineering

W.E.F. June 2013

FOUR YEAR DEGREE COURSE IN ENGINEERING & TECHNOLOGY

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus structure of T.Y. B.Tech. (Civil Engineering)

Sub No.	SEMESTER-I	Contact Hrs / Week				Examination Scheme						
	Subject	L	T	P	Total	CT	TH	TW	P	Total	Credits	Duration of Theory Exam
CED 301	Design of Steel Structure -I	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED 302	Water Resources Engineering -I	3	1		4	20	80	-	-	100	4	3 Hrs
CED 303	Professional Practice	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED 304	Geotechnical Engineering	4			4	20	80	-	-	100	4	3 Hrs
CED 305	Theory of Structure -II	4		-	4	20	80	-	-	100	4	3 Hrs
CED 306	Transportation Engineering -I	2	-	-	2	10	40	-	-	50	2	2 Hrs
CED 321	Lab-I (Design of Steel Structure -I)	-	-	2	2	-	-	25	25	50	1	
CED 322	Lab II (Professional Practice)	-	-	2	2	-	-	25	25	50	1	
CED 323	Lab III (Geotechnical Engineering)	-	-	2	2	-	-	25	25	50	1	
CED 324	Lab IV (STAAD Pro)	-	-	2	2	-	-	50		50	1	
CED 325	Lab V (Seminar)			2	2			50		50	1	
	Total of Semester-I	**22**	**0**	**10**	**32**	**110**	**440**	**175**	**75**	**800**	**27**	

Sub No.	SEMESTER-II	Contact Hrs / Week				Examination Scheme						
	Subject	L	T	P	Total	CT	TH	TW	P	Total	Credits	Duration of Theory Exam
CED 351	Design of Structures -II	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED 352	Foundation Engineering	4		-	4	20	80	-	-	100	4	3 Hrs
CED 353	Environmental Engineering -I	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED 354	Water Resources Engineering-II	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED 355	Elective -I	4		-	4	20	80	-	-	100	4	3 Hrs
CED 356	Engineering Geology	2	-	-	2	10	40	-	-	50	2	2 Hrs
CED 371	Lab VI (Design of Structures -II)	-	-	2	2	-	-	25	25	50	1	
CED 372	Lab VII (Environmental Engineering -I)	-	-	2	2	-	-	25	25	50	1	
CED 373	Lab VIII (Water Resources Engineering-II)	-	-	2	2	-	-	25	25	50	1	
CED 374	Lab IX (Engineering Geology)	-	-	2	2	-	-	50	-	50	1	
CED 375	Lab X (Project -I)	-	-	2	2	-	-	50	-	50	1	
	Total	**22**	**0**	**10**	**32**	**110**	**440**	**175**	**75**	**800**	**27**	
	Grand Total of I & II									**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

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Syllabus of T. Y. B. Tech. (Civil) Semester-V

Code No: CED 301	**Title: Design of Steel Structure - I**
Teaching Scheme: 04Hrs/week	**Class Test: 20 Marks**
Theory: 03Hrs/week	**Theory Examination (Duration): 03 Hrs**
Tutorial: 01Hr/week	**Theory Examination (Marks): 80**
Credits:04	

Objectives	**:**	This is a basic course to introduce basic concepts behind design of Steel Structures. This course acts as a prerequisite for the elective course Advanced Structural Design by Limit State Method as per IS: 800-2007
Unit-I	**:**	1. Introduction to structural design, Structural systems, Roll of the designer, Advantages of steel as a structural material, Types of structural steel, Mechanical properties of steel, various rolled steel sections (including cold-formed sections, structural pipe (tubes) sections and their properties. Codes and specifications. Design philosophies. **(06Hrs)** 2. **Principles of Limit state design**: Design requirement, limit states, action (Loads), design strength, deflection limits, other serviceability limits and stability check. **(04Hrs)**
Unit-II	**:**	1. **Bolted connections:** Behavior of bolted joints. Design strength of ordinary black bolts, Design strength of ordinary black bolts, Design of simple connections, Beam to beam, beam to column, framed connections. **(06 Hrs)** 2. **Welded connections:** Advantages and disadvantages, types and properties of welds, specification for weld, types of joints, Effective areas of welds, Design of simple connections, Beam to beam, beam to column, framed connections. **(06 Hrs)**
Unit-III	**:**	**Design of Tension members:** Types of tension members, Slenderness ratio, Behavior of tension members, Modes of failure, Design of angle sections for tension, tension member splice, and Lug angles. **(08 Hrs)**
Unit-IV	**:**	**Design of Compression Members:** Behavior of compression members, Modes of failure, Classification of cross section, Effective length of compression members, Design strength, Compression members in trusses, Design of columns subjected to axial loads, Laced and Battened columns. **Column bases:** Slab base and Gusseted base. **(06 Hrs)**
Unit-V	**:**	1. **Plastic theory:** Plastic hinge concept, Plastic collapse load, Plastic moment, Shape factor, Plastic section modulus. **(06 Hrs)** 2. **Design of beams:** Laterally restrained and unrestrained simply-supported beams. Design of compound beams. **(06 Hrs)** 3. **Design of plate girder**: elements of plate girders, economical depth, size of flange, shear buckling resistance of web, end panel design, anchor forces, design connection between flange and web plates, design of bearing stiffeners, web for end stiffeners, connection of intermediate stiffeners, to web, design of plate girder. **(06 Hrs)**

Unit-VI	**:**	Design of Roofing for an industrial building: Roofing materials, Types of trusses, Loading on roof trusses, Analysis of trusses, Design of various members of roof trusses. **(6 Hrs)**
Reference Books:	**:**	1. N. Subramanian – Design of Steel Structures – Oxford University Press. **2.** Design of steel structures – S.S. Bhavikatti by Limit State Method as per IS: 800 2007 **3.** Design of steel structures – K.S. Sai Ram by Limit State Method as per IS: 800 2007 **4.** Limit State Design in Structural Steel by M.R. Shiyekar

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.

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Syllabus of T. Y. B. Tech. (Civil) semester-V

Code: CED302 **Title: Water Resources Engineering-I**

Teaching scheme: 04 Hrs/ week **Class Test: 20 Marks**

Theory: 3Hrs /week **Theory Examination (Duration):03 Hrs**

Tutorial: 01 Hr/week **Theory Examination (Marks): 80**

Credits: 04

objectives	This is the basic course to introduce water resources, their occurrences, distribution, and application. This course acts as a pre requisite for design of various dam structures
Unit I.	**Water Resources Engineering:** Introduction, World ,India water resources, Necessity of irrigation , Irrigation techniques , types, methods of application water, introduction to drip, sprinkler, lift irrigation, benefits and ill effects of Irrigation, Quality of water for irrigation. **Water requirements of crops:** Function of irrigation water, types of soils and water available in various classes, evapotranspiration, field capacity, wilting point, base period, delta, duty and their relationship, Irrigation seasons, principal crops and crop rotation. Numericals **(10Hrs.)**
Unit II.	**Hydrology:** Introduction, Hydrological cycle, precipitation, measurement of rainfall, computation of average rainfall over a basin, Infiltration studies, factors affecting rainfall and runoff, estimation of flood discharge, hydrograph analysis. Unit hydrographs. Derivation of unit hydrograph from complex storms, Design flood and methods for its estimation, empirical formulae, flood frequency studies, recurrence interval. Routing of floods, Hydrological methods of flood routing. Numerical Ground Water Hydrology**:** Terminology, Occurrence and distribution of ground water, aquifers and its parameters, movement of ground water, wells in confined and unconfined aquifers, specific yields of wells. penetration of wells, interference of wells and its boundary ,Tube wells. Numerical. **(16 Hrs.)**
Unit III.	**Watershed Management:** Concept and Necessity of Watershed Management, steps involved in watershed management, treatment of ridge line in upper catchments and drainage line treatment, small structures, soil erosion control. **(4 Hrs.)**
Unit IV.	**Canal Irrigation System :** Canal classification, factors affecting the alignment of canals, design of canals in alluvial soils, Kennedy and Lacey's silt theories and their application to channel design, longitudinal section and cross section of an irrigation channel, terminology used for various components of canal cross section including borrow pits, balancing depth, canal breaches and repairs. Numerical. Distribution Works **:** C.D .Works, purpose, suitability, components and hydraulic design. Design of transitions.

	Numericals **(13 Hrs.)**
Unit V.	**Canal Regulation Works:** Necessity, location and types of falls, head regulators, cross regulators, their design, canal escapes. Outlets**:** Types of outlets, important definitions, non-modular, flexible and rigid modules. Numericals **(10 Hrs.)**
Unit VI.	**Water Logging , Salinity and Drainage:** Water Logging-causes and effects, controlling water logging. Reclamation of saline land. Losses in canal, drainage system requirements and types, Lining of irrigation channels. Types of lining, design of lined canals. **(07 Hrs.)**
References Books:	**1.** Hydrology- Jay Rarnireddy - Lakshmi Publications- Second Edition 2. Irrigation and water power Engineering- Punmia and Pande- Standard Publishers- Fifth Edition 3. Irrigation and Hydraulic structures- Santoshkumar Garg- Dhanpat Rai and Sons, New Delhi.- Ninth Edition 4. Hydrology for Engineers- Linsley, Kohler et al- TMH Publications

Section A – Unit I, II, III

Section B –Unit IV,V,VI

Pattern of Question Paper:

The six 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.

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Syllabus of T.Y. B. Tech. (Civil Engineering) Semester-v

Code No.: CED303
Teaching Scheme: 04Hrs/week
Theory: 03Hrs/week
Tutorial: 01Hr/week
Credits:04

Title: Professional Practice
Class Test: 20 Marks
Theory Examination (Duration): 03 Hrs
Theory Examination (Marks): 80

Objectives	:	To enable students to understand working out of the quantities of item/s involved in execution of various items with regards to quality and cost involved and thus enhance the ability of students to visualize, think logically to present and pursue the engineer approach and therefore desirable as an integral part of engineering education and training, irrespective of the branch specialization.
Unit-I	:	**Estimates and types of Estimates:-** Definition, importance of quantity estimation for civil engineer, purpose, types of estimates, data required for estimates Approximate Estimate, its need , Methods of preparation for various types of work as building road, bridges, Irrigation and public-health works Detailed Estimate, types of detailed estimate, purpose, data required for preparing detailed estimate, factors to be consider during preparation of detailed estimate, methods of taking out quantities, abstracting, units of measurements, building cost index, prime cost, provisional sum, centage charges, work charged Establishment, administrative approval, technical sanction, accompaniment to detail estimate. Revised, supplementary and reduced estimates and other types of estimates **(08 Hrs)**
Unit-II	:	**Taking out quantities:-** Methods of taking off, P.W.D. method Estimates for buildings (including roofs of different types) slab & pipe culvert, Earthwork, roads, railway track, canal, plumbing works, R.C.C. work, Abstracting bill of quantities **(14 Hrs)**
Unit-III	:	**Specifications:-**Definition, purpose and type, Principles of specifications drafting, Reference to PWD hand book, Red book, and detailed specifications for typical items construction items. **Analysis of rates:-**Factors affecting cost an item of work materials, labour, tools, and plant, overheads and profit. Task work-definition and factors affecting task work, Transportation of material and cost schedule of materials and labour, schedule of rates (D.S.R). Analysis of rates for various items of construction **(08 Hrs)**
Unit-IV	:	**Valuation:-**Definition purpose, nature of value, factors affecting value of land &buildings, free hold and leasehold property, salvage value, scrap value, market value, book value, prospective value, Sinking fund, depreciation, Year's purchase for terminable and non-terminable property, methods of working out depreciation & sinking funds, Methods of valuation of buildings, deferred payments. **(08 Hrs)**

Unit-V	**:**	**Contracts:-** Various agencies involved in construction industries, their role in contract with Govt. /semi- Govt./private organization , essentials of valid Contract, contract documents, performance of contract, breach and termination of contracts, Various types of contract with merits and demerits ,i.e. Item rate ,percentage rate, lump sum etc. including labour , transportation and material supply contract, rate contract **Tenders:**- definition , difference between contract & tender document, tender notice for press & detail tender notice, earnest money, security deposit, Retention money, Preparation, submission, opening of tender papers, Acceptance or rejection thereof. Informal and unbalanced tender. **(11 Hrs)**
Unit-VI	**:**	**Govt. procedure of works:-** PWD procedure of execution of work, Administrative approval, technical sanction, budget provision, measurements of work and bills, advance payment, secured advance ,nominal muster roll, Accounts of works & stores, tools &plants, material site account, daily diary, Different methods of execution of minor works in PWD, like piecework, rate list, day work, daily labour, Introduction to registration as a contractor in the P.W.D. Mortgage, Amortization, Arbitrations **(11 Hrs)**
Reference Books:	**:**	1. Estimating and Costing in Civil Engineering: Theory and Practice, By: B.N Dutta, Published By: S. Dutta & Company, Lucknow. 2. Estimating, Costing Specifications & valuation in Civil Engineering, By: M.Chakraborty Published By: Author. 3. Estimating and Costing By: G.S.Birdie 4. Estimating and Costing By: Rangwala Published By: Charotar Publishing House,Anand 5. Civil Engineering Contracts & Estimates By: B.S.Patil Published By: Orient Longman Ltd. Mumbai. 6. PWD Hand Book and Red Book 7. PWD District Schedule of Rates (DSR) – Latest

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:

5. Minimum ten questions
6. Five questions in each section
7. 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.
8. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

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Syllabus of T. Y. B. Tech. (Civil) Semester-V

Code No: CED304 **Title: Geotechnical Engineering**

Teaching Scheme: 04Hrs/week **Class Test: 20 Marks**

Theory: 04Hrs/week **Theory Examination (Duration): 03 Hrs**

Theory Examination (Marks): 80

Credits:04

Objectives	**:**	"The objective of this course is to introduce the civil engineering students to the behavior of soils under different loading conditions. It explores the natural characteristics, methods of classification and testing of soils as an engineering material."
Unit-I	**:**	**Introduction and Properties of soil:** Origin of soil, scope of "Geotechnical Engineering', Types of weathering, soil formation, and major soil deposits of India, Components of soils, soil Minerals, Mechanical composition of soil, volume and weight relationship. specific gravity, density, relative density, void ratio, porosity degree of saturation, functional relationships, moisture content, grain size analysis, mechanical and sedimentation analysis, consistency limits, soil texture and structure, elementary ideas about swelling sensitivity and thixotrophy. (**12Hrs**)
Unit-II	**:**	**Classification of Soil, Soil Moisture And Permeability:** Particle size classification, Highway Research BoardClassification, IS Classification and Unified Classification ,Soil moisture, effect of moisture content on soil, structural water, absorbed water, capillary water, Effective and neutral pressure. Critical hydraulic gradient, Seepage of water through soil, permeability, Darcy's law, discharge velocity and seepage velocity. factors affecting the permeability, Laboratory methods of determination Permeability, concept of flow net and its characteristics, graphical method of Flow net construction and its classification to isotropic soil. **(14 Hrs)**
Unit-III	**:**	**Stress Distribution in Soil** Boussinesq's equation for point load, vertical pressure under loaded circular area and uniformly distributed Load, preparation and use of Newark's Chart. **(04 Hrs)**
Unit-IV	**:**	**Compaction and Consolidation :** Proctor density and optimum moisture content. Comparison of' standard and modified proctor test factor, affecting compaction. Field methods of compaction control and mechanical stabilization of soil, compressibility of soil , Terzaghis one dimensional consolidation, secondary compression, square root of time fitting method and logarithm of time fitting method, coefficient of Consolidation. consolidation test. **(08 Hrs)**
Unit-V	**:**	**Shear Strength** Concept of shear strength, Principles stresses, Mohr's envelops for cohesive and non cohesive soils and composite soils, general principle of drained, Consolidated un-drained and drained tests. Determination of shear strength by direct, unconfined, tri-axial and vane Shear tests. Comparison of these methods. **(12 Hrs)**

Unit-VI	**:**	**Earth Pressure and Stability of slopes :** Earth pressure at rest, active and passive condition, elementary idea about .Rankine's and Coulomb's earth Pressure. Factors contributing to slope failures, Classification of Slope failures , Infinite and finite slope. The Swedish method and its application to dry cohesive soils and composite soils, Friction circle method, Taylor's number And stability curve. **(10 Hrs)**
Reference Books:	**:**	1. Soil Engineering in Theory and practice – Alam singh – Asia Publishing House. 2. Soil mechanics and Foundation Punmia B.C – Engineering Laxmi Publications 3. Geotechnical Engineering – P. Purushottam raj - Tata McGraw Hill 4. Geotechnical Engineering- B.J.Kasmalkar - Pune Vidyarthi Griha Prakashan 5. Geotechnical Engineering - C.Verikatramaiah - New Age International publishers 6. Soil Mechanics And Foundation - V.N.S. Murthy- Sai Kripa Technical Consultants. 7. A textbook of Geotechnical Engineering - Iqbal Hussain Khan - PHI, New Delhi

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.

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Syllabus of T. Y. B. Tech. (Civil) Semester-V

Code No: CED305 **Title: Theory of Structure - II**
Teaching Scheme: 04Hrs/week **Class Test: 20 Marks**
Theory: 04Hrs/week **Theory Examination (Duration): 03 Hrs**
Theory Examination (Marks): 80

Credits:04

Objectives	**:**	This is an introductory advanced course based on Theory of Structure - II. It introduces various basic concepts in Theory of Structure through theory and series of numerical examples. The course serves as a prerequisite for the advanced courses in structural analysis.
Unit-I	**:**	1) Basic Theorems of structural Mechanics, Maxwell's reciprocal theorems, Muller Breslau's Principle, Applications of these theorems **(04Hrs)** 2) Redundant pin-joint Trusses with degree of redundancy up to two, Lack of fit, Temperature stresses. **(06Hrs)**
Unit-II	**:**	Analysis of Indeterminate structures by Slope deflection method **(08Hrs)** Conjugate beam method for beams **(02Hrs)**
Unit-III	**:**	Analysis of Indeterminate structures by Moment distribution method. **(10 Hrs)**
Unit-IV	**:**	Analysis of beams and frames by Kani's method. **(10Hrs)**
Unit-V	**:**	1) Analysis of two hinged arches, Influence lines for B.M. and S.F., Rib-shortening, temperature stresses. **(06Hrs)** 2) Elastic center Analysis of fixed symmetrical arches. **(04Hrs)**
Unit-VI	**:**	Approximate methods of analysis of multistoried, multi bay rigid jointed frames. (i) Portal method (ii) Cantilever method **(04Hrs)**
Reference Books:	**:**	1. Theory of structures Timoshenko and Goodier 2. Basic Structural analysis C.S. Reddy. 3. Theory of Structures S. Ramamurtham. 4. Mechanics of Structures Vazrani and Ratwani. 5. Indeterminate Structural analysis J.S. Kenney 6. Modern Methods in Structural analysis B.N. Thedani. 7. Structural Mechanics H.M. Somayya

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.

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Syllabus of T.Y. B.Tech Civil Semester V

Code No: CED306

Title: Transportation Engineering-I

Teaching Scheme:2 Hrs/week

Theory: 2 hrs/week **Class Test: 10 Marks**

Theory Examination (Duration): 2 Hrs

Credits: 2 **Theory Examination (Marks): 40 Marks**

Objective	**:**	Objective of this module is to give an overview of the transportaion engineering in railway engineering. planning and design of Rail Transportation
Unit I	**:**	**Railway track and its components:** Railway Track, its construction and maintenance The permanent way, requirement of permanent way,gaug rails Requirementof rails, buckling of rails Rail Failures Rail joints,Creep, different theories of creep, prev wheel. Rail fixtures & fastenings, Different fixtures their purposes, **(05Hrs)**
Unit II	**:**	**A**.Rail Track on curve, Type of Gradient Grade compensation on curve, Ruling gradient, momentum gradi deficiency, Negative,cant Different terms used, necessity of points & crossing types of crossing, Track junctions, **(05Hrs)**
Unit III	**:**	**A.**Station Yards and its type ,requirement & Classification of Station, their purposes, location. **B.**Signaling & interlocking: Necessity of interlocking, principles & object of signaling & interlocking, Typ purpose. **(05Hrs)**
Unit IV	**:**	Bridge: Definition & components of bridges, classification of bridges, Preliminary data to be collected for selectio Investigation, Alignment, Traffic requirement of highway bridges, Waterway of bridge, Maximum flood discharge, Afflux, Approac Economic Span. **(04 Hrs)**
Unit V	**:**	**Substructures:** Abutments, Piers, Wing Walls, Setting out for piers and abutments, Materials for substructures Superstructures: Types of Bridges on the b Spans- Simple, continuous, cantilever, Arch, Suspension, Bow-String girder Bascule, Cut-boat, Flying, Li Traversing types Bridges. Suspension, Bow- String girder, Bridge flooring & its Types Temporary Bridge Definition, Waterway of a culvert, Types of culverts. **(06 Hrs)**
Unit VI	**:**	Loading of Bridges: Buoyancy Pressure, Centrifugal forces, Dead Load, Live Load, and Wind Load, Beari importance. Types of Bearings, Maintenance of bearings Maintenance of Bridges **(05 Hrs)**
Reference Books:	**:**	

Sr.No.	Title	Author	Publication	Edition
1	Railway Engg.	S.C.Saxena	Jain Book Depot	
2	Transportation Engg.	N.L.Arora	New India Publication,	
3	RaiIway Track Engg	J.S.Mundray	Tata Mc Graw.Hlll Publishing Co. Ltd.	
4	Bridge Engg.	Rangwala	Charotar Publishing House Pvt. Limited,	

		5	Bridge Engg.	S.P.Bindra	Dhanpat Rai Publications (p) Ltd	

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 eight questions.
2. Four question in each section.
3. Question no.1 from section A & Question no5 from section B made compulsory & should cover complete syllabus of the respective section& should be set for six marks each. The question no.1 & 5 should be of objective nature.
4. Two question of 07 marks each from remaining question, from each section A & B asked to solve.

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Syllabus of T. Y. B. Tech. (Civil Engineering) Semester- V

Code No.: CED321 **Title: Lab I Design of Steel Structure- I**
Practical/Term work: 02Hrs/week **Teachers Assessment: 25 Marks**
Credits:01 **Practical/Oral Examination : 25 Marks**

Objectives	**:**	The objective of this subject is student should be able to design and analysis of various types of Steel Structural elements related to Structural Engineering's.
Projects	**:**	• Design of an industrial building with mezzanine floor which should include the following: 1. Design of roof truss 2. Design of Purlins 3. Design of connections 4. Design of Beams 5. Design of Columns 6. Design of Base 7. Design of Beam to beam and beam to column connections 8. Detail design report 9. Drawing of the above elements on half imperial size drawing sheets (AUTOCAD may be used) • Report of a site visit mentioning structural details with relevant sketches of structural connections

Reference Books: **:**

Sr. No.	Title	Author	Publication
1	Design of Steel Structures	N. Subramanian	Oxford University Press
2	Design of steel structures Limit State Method IS 800:2007	S.S. Bhavikatti	I.K. International Publishing House Pvt. Ltd.
3	Design of steel structures by Limit State Method IS 800:2007	K.S. Sai Ram	Pearson
4	Limit State Design in Structural Steel by Limit State Method	M.R. Shiyekar	PHI Learning Pvt. Ltd.

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

- Continuous Assessment
- Performing the experiment given in Laboratory

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Code No.: CED322 **Title: Lab-V Professional Practice**
Practical/Term work: 02Hrs/week **Teachers Assessment: 25 Marks**
Credits:01

Objectives	**:**	To understand actual working out quantities of various items of works including writing specification, rate analysis and actual procedure of contracts and tendering.
List of Practical	**:**	The term work shall consist of following (any five) 1. Detailed estimate of a double storied building using D.S.R. rates. 2. Detailed estimate of roadwork with cross slope / railway track / runway. 3. Working out quantities of steel reinforcement for a slab, a beam, a column, a footing and preparing bar bending schedule. 4. Estimating quantities for any one of the following:- a. House drainage & water supply arrangement b. Formwork items in a RCC structure. c. Pipe culvert or slab culvert. d. Septic tank with soak pit. 5. Drafting detail specification of any two items and working out their rates using market prices. 6. Valuation report of a residential building using O-1 form. 7. Preparation of draft tender notice and collecting minimum 3 tender notices of Civil Engineering works. **Note: Any one of the above assignment should be done using estimating and costing software.**
Reference Books		**Reference Books** 1. Estimating and Costing in Civil Engineering: Theory and Practice,By: B.N Dutta Published By: S. Dutta & Company, Lucknow. 2. Estimating, Costing Specifications & valuation in Civil Engineering,By: M.Chakraborty Published By: Author. 3. Estimating and Costing By: G.S.Birdie 4. Estimating and Costing By: Rangwala Published By: Charotar Publishing House,Anand 5. Civil Engineering Contracts & Estimates By: B.S.Patil Published By: Orient Longman Ltd. Mumbai. 6. Valuation of Real Estates By:Rangwala Published By: Charotar Publishing House,Anand **Handbooks** 1. Practical Information for quantity Surveyors, Property Valuers, Architects, Engineers and Builders.By:P.T Joglekar Published By: Pune Vidyarthi Griha Prakashan, Pune. **Codes** 1. I.S.1200 (Part 01 to 25): Methods of Measurement of Building and Civil Engineering Works. 2. D.S.E: District Schedule of Rates

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

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of T. Y. B.Tech.Civil Semester-V

Code No.: CED323 **Title: Lab-V Geotechnical Engineering**
Practical/Term work: 02Hrs/week **Teachers Assessment: 25 Marks**
Credits:01

Course Objectives	**:**	"The objective of this course is to introduce the civil engineering students to the behavior of soils under different loading conditions. It explores the natural characteristics, methods of classification and testing of soils as an engineering material."
List of Practical	**:**	The term work shall consist of a record of laboratory experiments as mentioned below: 1. Determination of specific gravity 2. Field density test 3. Determination of particle size distribution of soil 4. Determination of Atterberg's Limits 5. Permeability test-variable or constant head method 6. Standard proctor compaction test 7. Direct shear test 8. Unconfined compression test 9. Tri-axial shear test 10. Consolidation test 11. Static cone penetration test 12. Standard Penetration test Note: Minimum 10 experiments should be carried out, out of 8, 9, 10, 11 and 12 four demonstration experiments will be permitted.
Reference Books		**1**. Soil Engineering in Theory and practice – Alam singh – Asia Publishing House. 2. Soil mechanics and Foundation Punmia B.C – Engineering Laxmi Publications 3. Geotechnical Engineering – P. Purushottam raj - Tata McGraw Hill 4. Geotechnical Engineering- B.J.Kasmalkar - Pune Vidyarthi Griha Prakashan 5. Geotechnical Engineering - C.Verikatramaiah - New Age International publishers 6. Soil Mechanics And Foundation - V.N.S. Murthy- Sai Kripa Technical Consultants. 7. A textbook of Geotechnical Engineering - Iqbal Hussain Khan - PHI, New Delhi

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of T. Y. B. Tech. (Civil Engineering) Semester- V

Code No.: CED 324 **Title: Lab IV: STAAD.Pro**
Practical/Term work: 02Hrs/week **Teachers Assessment: 50 Marks**
Credits:01

Objectives	**:**	Student will be able to handle STAAD.Pro which is the most popular structural engineering software product for 3D model generation, analysis and design. It has an intuitive, user-friendly GUI, visualization tools, powerful analysis and design facilities.
List of Experiments	**:**	1.Elements of the STAAD.Pro Screen 2.Starting a New Project 3.Defining Structure Geometry/ Modeling 4.Setting the Project Units 5.Assigning Member Specifications 6.How to specify member releases, Additional Member 7.Specifications 8.Assigning Supports and Loads 9.Creating the Load Cases 10.Creating the Combination Load Case 11.Performing the Analysis 12.Design 13.Design Viewing the Output File 14. Case study of Residential Building

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of T. Y.B. Tech. civil Semester V

Code No.: CED325 **Title: Lab V Seminar**
Practical/Term work: 02Hrs/week **Teachers Assessment: 50 Marks**
Credits:01

Course Objectives	**:**	1. To create awareness amongst pre final year students for latest technological Aspects. 2. To improve presentation and communication skills. 3. To inculcate qualities of team work and team spirit. 4. To motivate for research work in the respective areas. 5. To have common platform where interaction between various groups of students will take place on the various advanced and emerging topics of technology. 6. To improve skills related to search on the internet. 7. To realize importance of basic technological aspects.

Guidelines for students and faculty

1. Seminar topics may be chosen by the students with advice from the guide/Industry persons, which shall be finalized by guide and approved by concerned head of the department. Students are to be exposed to the following aspects of the seminar presentation.
    a. Literature Survey / Review
    b. Organization of the material
    c. Preparing for presentation
    d. Technical writing

2. Each student is required to-
    a. Submit one page synopsis before the seminar talk for display on the notice board and
    b. Give a 20 minutes presentation through OHP, PC, and Slide projector followed by a 10 minute question answer session.

3. For award of Sessional marks:
    a. 25 marks - based on the assessment done by internal guide during semester and the involvement of student in the work assigned related to the seminar topic
    b. Remaining 25 marks based on the examination at final presentation. Student is to be examined on the basis of an oral and written presentation by at least two examiners, one of them shall be guide and other as an external examiner appointed by the principal of the institute.

Seminar Report Format

1. The Seminar Report shall be typed on A-4 size white bond paper.
2. Typing shall be with spacing of 1.5 using one side of the paper.
3. Margins :- (i) Left 37.5 mm.
   (ii) Right, top and bottom 25 mm.
4. Binding: - Hard with golden embossing on the front cover of brown colour
5. Front cover of hard bound report:- It should be identical to first title page.
6. Default font size TNR-12
7. Format for title page (First Page) (Centre justified)

Report of Seminar (TNR-14, Bold)

In (TNR-12)

{Title}(TNR-18, Bold)

By (TNR-12)

{Name of student}(TNR-16, Bold)

(Roll No:) (TNR-12)

Submitted in partial fulfillment of the requirement for (TNR-12)

Degree of Bachelor of Technology (Branch Name) (TNR-14, Bold)

of (TNR-12)

Dr. Babasaheb Ambedkar Marathwada University,

Aurangabad. (TNR-14, Bold)

Department of _____Engineering, (TNR-14, Bold)

Maharashtra Institute of Technology, (TNR-16, Bold)

Aurangabad. (TNR-14, Bold)

200 - 200 (Academic Year) (TNR 14)

Format for Certification page (Second page)

CERTIFICATE (TNR-16, Bold)

This is to certify that the Seminar Report (TNR-12)

Submitted by (TNR-12)

(Name of Student) (TNR-14, Bold)

(Roll No: __) (TNR-12)

Is completed as per the requirement of the Dr. Babasaheb Ambedkar Marathwada University, Aurangabad in partial fulfillment of (TNR-12)

Degree of Bachelor of Technology (Branch Name) (TNR-14, Bold)

For the academic Year 20__ - 20__(TNR-12)

(Name)	(Name)	(Name)
Guide	Head of Department	Principal (TNR -12, Bold)

8. The third page will be certificate issued by the industry regarding the completion of Seminar if applicable.
9. The fourth page would be for acknowledgement, which would be followed by index page (Fifth page).
10. Sketches should be drawn on separate sheet (minimum A4 size) and be inserted at proper places. The sketches should be drawn in black ink and be numbered.
11. Tables should preferably type in the text only.
12. The mathematical symbol should be typed or neatly written so as to match darkness of the text.
13. The last item on the index should be references.
14. Page number must appear on the right hand top corner of each page starting after index page.
15. The contents of the seminar can be decided by the internal guide / department and student.
16. Minimum number of copies = 5 Copies (Central Library + Department + Internal Guide + External Examiner + Student). The copy of External Examiner will be submitted by the student after completion of Seminar.

Report of Seminar

in

Effect of Fly Ash on Properties of Concrete

by

Mr. Manish S. Dixit

(Roll No: T3103)

Submitted in partial fulfillment of the requirement for

Degree of Bachelor of Technology (Civil Engineering)

of

Dr. Babasaheb Ambedkar Marathwada University

Aurangabad

Department of Civil Engineering,

Maharashtra Institute of Technology,

Aurangabad.

2013 - 2014

CERTIFICATE

This is to certify that the Seminar Report

Submitted by

Mr. Manish S. Dixit

(Roll No: T3103)

Is completed as per the requirement of the Dr. Babasaheb Ambedkar Marathwada University, Aurangabad in partial fulfillment of

Degree of Bachelor of Technology

(Civil Engineering)

For the academic Year 201 -1

(Name)	**(Name)**	**(Name)**
Guide	**Head of Department**	**Principal**

General Attributes

- Chapter heading -All Capital—TNR 14 Font (Bold)
- Heading –All Capital- TNR 12 Font (Bold)
- Subheading–Title case- TNR12 Font (Bold)
- Text – TNR11 Font
- Title of the Report should not be more than two lines
- Page numbers are at right hand corner at ½ inch from right and top side.
- Page number should be allotted only from Chapter no. 1 onwards.

References

Last chapter of the report is references including the addresses of websites.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted (Internally) on the syllabus and term work mentioned above.

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of T.Y. B. Tech. (Civil Engineering) Semester-VI

Code No.: CED 351	**Title: Design of structures-II**
Teaching Scheme: 04Hrs/week	**Class Test: 20 Marks**
Theory: 03Hrs/week	**Theory Examination (Duration): 03 Hrs**
Tutorial: 01Hr/week	**Theory Examination (Marks): 80**
Credits:04	

Objectives	**:**	"DOS-II (RCC) is the core subject in civil engineering. Without knowledge of this subject students could not design the structures like residential or public buildings."
Unit-I	**:**	**Introduction to structural design:** Engineering structures and structural design, objective of structural design, types of structural actions and Forms. Design philosophies: WSM, ULM, LSM, salient features of each method, merits and demerits of each method, types, classification of limit states, characteristic strength and load, partial safety factors. **(06 Hrs)**
Unit-II	**:**	**Limit state of collapse (flexure):** Singly, doubly and flanged (T & L)reinforced sections, Properties of a section according to I.S. code, design parameters, Analysis and design for f lexure by LSM. **(12 Hrs)**
Unit-III	**:**	**Limit state of collapse:** **shear:** Shear behavior up to failure, types of failures, factors affecting shear failure, strength of RC beams in shear, design of shear reinforcement as per IS-456. **Bond:** Types of bonds, factors affecting bond strength, check for development length. **Limit state for better performance:** **(a)** LS of serviceability - its significance in deflection control, types of deflections, IS requirements **(b)** LS of cracking-causes, mechanism, effects, Classification and types of cracks, bar detailing rules. **(12 Hrs)**
Unit-IV	**:**	**Design of slabs:** One way, two way, simply supported, cantilever and continuous slabs. **Design of stairs:** Design of dog-legged stairs and open well stair case . **(12Hrs)**
Unit-V	**:**	**Limit state of collapse (compression and bending):** a)Analysis and design of axially loaded short columns, Analysis under uni-axial bending and axial compression, stress block parameters, Interaction (Pu-Mu) diagrams, Analysis and design of section, Bi-axial and axial compression, Slender columns design methods (Column design charts of SP-16 to be used). b) Design of isolated column footing for axial load, uni-axial and biaxial bending. **(12Hrs)**

Unit-VI	**:**	**Prestressed concrete:** Introduction to pre-stressed concrete concept of pre-stressing, advantages, disadvantages and comparison with RCC, need of high strength materials, pre tensioning, post tensioning, various cables profiles, Load balancing concept, losses. **(06 Hrs)**
Reference Books:	**:**	1. Design of R.C. structure, By: A. K. Jain, Published By: NEM chand,Roorkee 2. Design of R.C. structure, By: Dr. Shah & Karve Published By: Structures publishers,pune 3. Design of R.C. structure, By: Ramamurtham Published By: Dhanpat Rai & Sons 5. R. C. C. Designs- Dr. B. C. Punmia 6. Fundamentals of Reinforced Concrete- Sinha and Roy 7. Design of Concrete structures- J. N. Bandopadhyay **Other references:** 1. IS-456-2000 2. SP-16 3. Hand book of concrete reinforcement & detailing —SP-66 4. Illustrated design of R.C. design DR. Shah & Karve 5. Manuals of R.C.C.design software like STADD etc.

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:

9. Minimum ten questions
10. Five questions in each section
11. 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.
12. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

`Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of T. Y. B. Tech. (Civil) Semester-VI

Code No: CED352 **Title: Foundation Engineering**

Teaching Scheme: 04Hrs/week **Class Test: 20 Marks**

Theory: 04Hrs/week **Theory Examination (Duration): 03 Hrs**

Theory Examination (Marks): 80

Credits:04

Objectives	**:**	**Objective:** "After studying the subject, students will be able to analyze and preliminary design the structures related to foundation design such as piers, caissons, and cofferdams, as it is an integral part and parcel of civil engineering discipline. So also students will understand the concept of bearing capacity and settlement related to design of the above structures and related permissible Criteria of B.I.S. Codes."
Unit-I	**:**	**Bearing Capacity:** Theories, Terzaghi's, Prandtl, Balla's, Meyer off, ultimate net and safe bearing capacity, local and general shear failure case of strip, square and squire footing, plate load test and their limitations, standard penetration test. Factor affecting bearing capacity of foundation bed effect of water table and eccentricity of loading bearing capacity **(16Hrs)**
Unit-II	**:**	**Settlement analysis:** Causes and control of settlement, immediate settlement, consolidation settlement, differential settlement. Predication of foundation settlement from plate load test, Tolerance of superstructure. **(06 Hrs)**
Unit-III	**:**	**Footing and Raft Foundation :** Design consideration and construction of different type of footing on sand and clay Proportioning of For equal settlement, combined footing, cantilever footing ,Design consideration and construction of different types of raft **(08 Hrs)**
Unit-IV	**:**	**Pile Foundation:** Types of pile foundation their use and function, timber, precast cast in situ piles. Method of pile driving and pile driving hammer, Effect of pile driving on ground. Selection types of pile foundation, Determination of length, Design of pile foundation. Determination of bearing capacity from theoretical analysis, point bearing friction bearing, negative Friction, pile capacity by static and dynamic formula, limitation dynamic analysis Group action, number and spacing of pile, in group under reamed piles. Design of under reamed piles. **(14 Hrs)**

Unit-V	**:**	**Cofferdam ,Well and Cassions :** Sheet piles, sheet pile walling, type of sheet piles, analysis and design of sheet pile wall. Types of cofferdam, Uses and salient features of construction, single wall and double wall, cellular cofferdam and types. Design of braced cofferdam cellular dam, circular and diaphragm type. Pumping and sealing of bottom of cofferdam. Types of well, component part, choice of particular type. Design forces load, scour depth, sinking, frictional résistance for well tilting and method of correction of wells. Caissons open box, drilled pneumatic caisson safety problem, caisson disease, working, uses salient construction features. **(12 Hrs)**
Unit-VI	**:**	**<u>Foundation of black cotton soil :</u>** Characteristics of B.C soil, foundation problems in B.C soil, foundation technique. Dewatering of foundation special features for foundation for tower and tanks. **(04 Hrs)**
Reference Books:	**:**	1. Foundation Engg. - B.J. Kasmalkar - Pune Vidyarthi Griha - 3rd edition 2. Soil Mechanics and Foundation Engg. - B.C .Punmia - Laxmi Publications - 16th edition 3. Foundation design and construction - M.J.Tomlison 4. Foundation design - W.C.Teng - Prentice Hall of India 5. Foundation Engg. - D.R.Phatak

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.

`Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of T. Y. B. Tech. (Civil) Semester-VI

Title: Environmental Engineering-I

Code No: CED353

Teaching Scheme: 04Hrs/week **Class Test: 20 Marks**

Theory: 03Hrs/week **Theory Examination (Duration): 03 Hrs**

Tutorial: 01Hr/week **Theory Examination (Marks): 80**

Credits:04

Objectives	**:**	"A knowledge of Environmental Engineering-I help the engineers to analyze, think logically and pursue the engineering approach for the benefits of society and therefore desirable as an integral part of engineering education and training, irrespective of the branch specialization."
Unit-I	**:**	**Water demand & quantity:** Introduction to water supply scheme, different components of water supply scheme, **,** water demands, its variation , different factors affecting water demand, design of components, population forecasting methods, examples **(09Hrs)**
Unit-II	**:**	**Quality of water & its analysis:** Wholesome water, potable water, contaminated water, impurities in water. Analysis of water-physical, chemical & biological tests. Microorganism in water and water borne diseases. IS standards. **(05Hrs)**
Unit-III	**:**	**Water treatment and softening process :** Principles of water treatment process, layout of WTP, screening ,aeration, Primary settling, flocculation, clariflocculator; sand filters, disinfection, methods of disinfection ,boiling, chlorination , forms of chlorination chlorine demand & its estimation, break point chlorination, double chlorination tests, bleaching power estimation ,design of various components of water treatment plant. Examples Water softening Methods, lime soda & zeolite process, removal of colors, odours & tastes, treatment with activated carbon , copper sulphate & oxidizing agents, removal of iron & manganese, Fluoridation & Defluoridation , Removal of radio-activity, Desalination & its methods. **(22 Hrs)**
Unit-IV	**:**	**Conveyance and Distribution system of water:** Intakes their types and design ; Pipes , types on the basis of material used, stresses in pipes, corrosion & its prevention, Pipe appurtenances, Methods of distribution, Storage and distribution reservoirs —locations & types, Capacity estimation methods , numerical based on methods , Layouts of distribution

		system, Analysis and Design of distribution system – examples. Water piping systems and its plumbing in buildings, pumped system **(18 Hrs)**
Unit-V	**:**	**Water supply plumbing system in buildings:** Water piping systems in buildings, pumped system **(06 Hrs)**
Unit-VI	**:**	**Air pollution:** Various layers of atmosphere, types of pollutants, Sources of air pollution & its effect on human beings property , plants & animals, control technique for SPM & gaseous pollutant (three methods of each), problems on particulate matter . **(6 Hrs)**
Reference Books:	**:**	**5.** Howard, S. Peavy – Environmental Engineering – McGraw-Hill International Editions **6.** **2..**A. K. Chatterjee- Water supply, Waste disposal& environmental Engineering- Khanna publishers **7.** S.K.Garg – Water supply Engineering - Khanna Publishers 8. B.C.Punmia, Ashok Jain**,** Arun Jain- Water supply Engineering- Laxmi Publications **5**.G.S.Birde,J.S.Birde- Water Supply & Sanitary Engineering- Dhanpat Rai Publishing company **6**. M.N.Rao - Air Pollution **7**. Murli Krishan- Air Pollution

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:

13. Minimum ten questions
14. Five questions in each section
15. 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.
16. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

`Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of T. Y. B. Tech. (Civil) Semester-VI

Title: Water Resources Engineering-II

Code No: CED354

Teaching Scheme: 04Hrs/week **Class Test: 20 Marks**

Theory: 03Hrs/week **Theory Examination (Duration): 03 Hrs**

Tutorial: 01Hr/week **Theory Examination (Marks): 80**

Credits:04

Objectives	**:**	"After the basic study of natural water resources in the earlier course of WRE-I, the objective of this course is to implement basic knowledge to create structures for engineering of water resources and make benefits to mankind by and large."
Unit-I	**:**	**Planning of Reservoirs:** Definitions, Types, Ideal site of reservoir ,determination of storage capacities, mass curve.Analysis, life of reservoirs, life of reservoirs, economic height of dam, various types of dams with relative merits, economics of height of dam, multipurpose rservoirs. **(08Hrs)**
Unit-II	**:**	**Gravity Dams:** Definitions various forces acting on gravity dams, modes of failure, , Low and high gravity dams, stability analysis, design of low and gravity dams, galleries, joints, keys and crack control in gravity dams, principle stresses in gravity dams, **(10Hrs)**
Unit-III	**:**	**A) Earth Dams:** Definition, types of earth dams, components and their functions, causes of failure, design criteria, stability analysis, seepage through the body of dam and the foundation of the dam and its control **B)Arch and Buttress dams:** Types and suitability, different forces acting, stability criteria **(10Hrs)**
Unit-IV	**:**	**A) Diversion Head Works:** Layout, Site selection, component, weirs and their types, causes of failure, design of weir by Bligh and Khosla's theory, **B) Spillways:** Definitions, types, suitability under different conditions, features of construction, design criteria, IS recommendations, spillways gates, energy dissipation in spillways, **(13Hrs)**
Unit-V	**:**	**Minor Irrigation Works and Practices:** Definition and general introduction, isolated tanks and tanks in series, design and selection of a tank bund, tank weirs or surplus escaping weirs, their design principles, tank outlets or sluices and their design principles, Bandhara irrigation, design of bandharas, K.T. Weirs, Farm irrigation, methods of farm water supplies, PIP and CIP, design of a chak, on farm structures, introduction to Maharashtra Irrigation Act, Methods of water charge assessment, CADA and participatory irrigation. **(13Hrs)**
Unit-VI	**:**	**Hydro electric power:** Thermal and hydropower, classification of hydel plants, runoff river plants, storage plants, pumped storage schemes, principal components of hydro electric plants, foreway, intake structures, penstocks, surge tanks. **(04Hrs)**

Reference Books:	**:**	**9.** Punmia and Pande – Irrigation and Water Power Engineering – Standard Publishers **10.** Santoshkumar Garg - Irrigation and Hydraulic Structures - Khanna publishers 11. S.K.Garg – Water supply Engineering - Standard Publishers B.C.Punmia, 12. K.R.Arora - Irrigation , Water Power and Water Resources Engineering - Standard Publishers

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:

17. Minimum ten questions
18. Five questions in each section
19. 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.
20. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr.Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of T. Y. B. Tech.Civil Semester-VI

Code No: CED355 | **Title:EL-I A Prestressed Concrete**
Teaching Scheme: 04Hrs/week | **Class Test: 20 Marks**
Theory: 04Hrs/week | **Theory Examination (Duration): 03 Hrs**
Theory Examination (Marks): 80
Credits:04

Objectives	**:**	"The purpose of the subject of Prestressed Concrete is to make the students aware of the Analysis and design of prestressed Concrete members for various types of failure and limit states."
Unit-I	**:**	**Introduction** Introduction to Prestresed Concrete. Pre-tensioning, Post-tensioning, Methods of Prestressing. Advantages and Disadvantages, Materials Used, Need of high strength materials, various terms and definitions. Losses in prestressing, equations to evaluate losses, I. S. code provisions Application of various limit states in design of PC sections , I,S. Code provisions. Analysis of prestress and bending stresses due to self weight and imposed loads. Load balancing concept. **(10 Hrs.)**
Unit-II	**:**	**Analysis of stresses** Resultant stress in PC member Thrust line or pressure line. Shift of pressure line,Analysis of stresses by Internal resisting couple method. **Strength of p.c.sections** Types of flexural failures, Flexural Strength of PC sections. Strain compatibility method, simplified I.S. Code method. Numerical on rectangular sections, flanged sections with X <D and Xi,> D for pretensioned, bonded post - tensioned members and unbounded post-tensioned members. **(10 Hrs.)**
Unit-III	**:**	**Shear and bond strength of p.c.sections** Principal tension in axially prestressed and with transverse prestressed members. Ultimate Shear resistance of sections (Web Shear failure, flexural Shear failure), Design of Shear reinforcement — I.S. Code Provisions, Transfer of prestress — Transmission of Prestressing force by bond., transmission length, Bond stress, code provisions for bond and transmission length. **(10 Hrs.)**
Unit-IV	**:**	**Analysis and design of end blocks** Anchorage zone Stresses in Post - tensioned members, Stress distribution in End Block, Anchorage zone Reinforcement, Principles of dimensioning **Limit state design criteria-** Philosophy of LSM, Design loads and Strengths, Strength and serviceability limit states. **Design of p.c. sections:** Design for flexure,Equations for Prestressing force, minimum section modulus and eccentricity. Limitations for long span beams, Limiting zone for Tendons, Design for axial tension,bond,compression,flexure. **(10 Hrs.)**

Unit-V	**:**	**<u>Analysis and design of continuous beams</u>** Advantages of continuous members Method of Analysis of secondary moments, Concordant Cable profile, Guyon's theorem, Linear transformation, Ultimate load Analysis, Design of continuous beams. **<u>Circular prestressing:</u>** Circular Prestressing, Types of pipes, Design of circular pipes, Circular tanks ,Analysis of tanks. **(10 Hrs.)**
Unit-VI	**:**	**<u>Composite sections:</u>** Types of composite construction, Analysis of stresses, Strength and serviceability limit states, Flexural strength of a composite section, Shear strength of a composite section, Design of composite sections. Prestressed concrete poles and sleepers **(10 Hrs.)**
Reference Books:	**:**	1. Prestressed Concrete BY N. Krishna Raju, Tata McGraw-Hill Publishing Co.Ltd , Ninth edition. 2. Prestressed Concrete BY T. Y. Lin, Tata McGraw-Hill Publishing Co.Ltd , Ninth edition. 3. Prestressed Concrete BY S. Ramamurtham- Dhanpat rai Co.and Sons 4. Prestressed Concrete BY Pandit and Gupta CBS Publishers & Distributors, 5. Prestressed Concrete BY Rajgopalan N. Alpha Science International, Limited Second edition. 6. www.pci.org

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:

21. Minimum ten questions
22. Five questions in each section
23. 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.
24. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

`Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of T. Y. B. Tech. (Civil) Semester-VI

Code No: CED355	**Title: El-I B Advance Geotechnical Engineering**
Teaching Scheme: 04Hrs/week	**Class Test: 20 Marks**
Theory: 04Hrs/week	**Theory Examination (Duration): 03 Hrs**
	Theory Examination (Marks): 80
Credits:04	

Objectives	**:**	Objective: "Geotechnical engineering is a core subject of civil engineering. After studying this subject, the students will be able to use the soil as construction and foundation material and he should be logically able to identify and classify any practical soil in- site and design any type of foundation as needed and best suited."
Unit-I	**:**	**Soil structures , minerals and seepage flow:** Soil structures and textures, solid particles in soil, atomic and molecular bonds, diffuse double layer, colloid, repulsion and attraction, interparticle forces in soil mass, structures of clay minerals like kaolinite, montmorillonite, illite (detailed).Seepage pressure, quick sand conditions, Laplace's equation in Cartesian and radial co-ordinates, flow nets and their properties, graphical methods of constructions of flownets, flownets for anisotropic soil, determination of phreatic lines for homogeneous earthen dams, Kozehy's and casagrande'method **(12Hrs)**
Unit-II	**:**	**Shear strength:** Concept of Mohr's strength circle for soil, failure criteria, measurement of shearing strength by various laboratory tests, Shear strength of cohesion less soils, liquefaction and critical voids ratio, l-lvarslev' shear strength parameters and skemptons pore pressure parameters. **(08 Hrs)**
Unit-III	**:**	**Earth pressure:** Concepts, states of plastic equilibrium, Rankine, and Coulomb, Earth pressure theories, rebhann's analysis of active and passive pressures, culmanns's graphical methods, friction circle method for passive pressure, applications of earth pressure theories to various field conditions such as retaining wall with broken back, submerged backfill, concentrated surcharge load. **(10 Hrs)**
Unit-IV	**:**	**Stabilization of soils and Elements of soil dynamics:** Mechanism of soil stabilization, methods such as cement lime, bitumen, electrical stabilization, stabilization of soil with and without additives, reinforced earth and geo-synthetic (use and application). Introduction, fundamentals of vibrations, soil dynamics, vibration isolation. **(10 Hrs)**
Unit-V	**:**	**Consolidation:** Terzaghi's theory of one dimensional consolidation, determination of pre-

		consolidation pressure, consolidation settlement, field consolidation (typical and laboratory methods), consolidation curves, elementary concept of secondary consolidation, solution of Terzaghi's equation for one dimensional Consolidation. **(10 Hrs)**
Unit-VI	**:**	**Machines foundation:** Special features of machine foundations, foundations for reciprocating and impact machines, constructional aspects of machine foundation (**10 Hrs**)
Reference Books:	**:**	1. Soil mechanics and foundation Engg - Dr.B.C punmia - Dhanpat rai and Sons 2. Geotechnical Engg. - Venkatramayya 3. Geotechnical Engg. - Dr. B.J Kasmalkar - Pune vidyarthgraha

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.

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Syllabus of T. Y. B. Tech. (Civil) Semester-V

Code No: CED355 **Title: EL-I C Environmental Pollution and Control**

Teaching Scheme: 04Hrs/week **Class Test: 20 Marks**

Theory: 04Hrs/week **Theory Examination (Duration): 03 Hrs**

Theory Examination (Marks): 80

Credits:04

Objectives	**:**	Student will be acquainted with various types of pollutions, their units, measurement, instruments in practice. To make the environment pollution free . Engineers have significant role for human being, animals and plants.
Unit-I	**:**	**Air Pollution:** Types of pollutants, source effects, sink and control of primary pollutants – CO, Nox, HC, Sox and particulates, effects of pollutants on man and environment – photochemical smog and acid rain.Industrial hygiene-sources of dust and gaseous Pollutants in the industry occupation Hazards, Exposure tolerance level Protection Measures, Legal control. **(12 Hrs)**
Unit-II	**:**	**Noise Pollution-** Definition, Decibel levels of common noises, Hazards of noise pollution, Measures for noise reduction, control of noise pollution. The menace of noise pollution in India-Abstract Introduction-Engineering description of noise and sound Hearing principle-Frequency Analysis -Noise standards Noise control terms & units. Noise Pollution: Introduction, The describe scale, effects of noise – physiological and psychological effects, Measurement of noise levels, Noise control in industrial establishments. **(12Hrs)**
Unit-III	**:**	**Soil Pollution:** Composition of soil, classification and effects of soil pollutants and their control.**)** **(06Hrs)**
Unit-IV	**:**	**Solid Waste Pollution:** Classification, waste treatment & Disposal methods (Composting, sanitary land filling, thermal processes, recycling and reuse).Origin of domestic solid wastes, refuse analysis composition & quantity of refuse & transportation of refuse, economics of refuse collection. Solid waste in industries, agricultural waste – its effect on environment. Solid waste handling methods, treatment & disposal of solid wastes. Sanitary land fills lechates and latest methods. **(12 Hrs)**
Unit-V	**:**	**Composting :** Theory of composting, design of composting plant, recovery of bio-energy from organic waste. Incineration, Pyrolysis & its by-products. Cost economics studies in solid waste management. Introduction to linear programming & transportation problem, route & cost optimization. Cost economics studies in solid waste management. **(08 Hrs)**
Unit-VI	**:**	**Hazardous Wastes:** Classification – radioactive, biomedical and chemical, treatment and disposal – physical, chemical and biological processes. Environmental Toxicology and control,

		toxic effects and control of metal pollutants like Hg, Col, Pb, V, Cr, Co, etc. Disease measurement and control of occupational diseases. Environmental Pollution Monitoring Instruments, Air Pollution monitoring Instruments CO, SO2 Hydrocarbons and Ozone, Water pollution monitoring instruments **(10 Hrs)**
Reference Books:	**:**	1. S. M. Khopkar, "Environmental Pollution Analysis", New Age 2. A. K. Datta, "Introduction to Environmental Science & Engineering", Oxford & IBH, New Delhi 3. H. s. Peavy & Rowe, "Environmental Engineering", Mc.Grow Hill Inst. 4. C. S. Roa, "Environmental Pollution Control", New Age 5. Sawyer Mc Carty G. F. Parkin, "Chemistry for Environment Engineering & Science" TMH

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.

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(Faculty of Engineering & Technology)

Syllabus of T. Y. B. Tech. (Civil) Semester-VI

Code No: CED356	**Title: Engineering Geology**
Teaching Scheme: 02Hrs/week	**Class Test: 10 Marks**
Theory: 02Hrs/week	**Theory Examination (Duration): 03 Hrs**
Credits: 02	**Theory Examination (Marks): 40**

Objectives	**:**	Since every civil engg. Structure is located on or within the crust of the earth, to educate the student of civil engg about the direct bearing of geological conditional of project site on the stability, economics & life of civil engg structure.
Unit-I	**:**	**Geology –** Definitions, scope and importance in Civil engineering. **Mineralogy** – Minerals and ores. Important rock forming minerals and their groups. **Igneous rocks –** Magma and lava, crystals and glass, cooling of magma under plutonic, hypabyssal and volcanic conditions. Textures of igneous rocks. **Secondary rocks –** Stages in the formation of secondary rocks, classifications of secondary rocks and sedimentary rocks, consolidation of loose sediments, Characteristics and textures of sedimentary rocks, important secondary rocks. **Metamorphic rocks -** Metamorphism, agents and types of metamorphism, stress and anti stress minerals, structures of metamorphic rocks, important metamorphic rocks**. (08 Hrs)**
Unit-II	**:**	**Structural geology** – Strike, true dip, apparent dip. i) Fold – Definition and parts of fold, following types of fold : Anticline and syncline, symmetrical and asymmetrical fold, Isoclinal fold, Recumbendant fold. ii) Fault – Fault and fracture, parts of fault. Following parts of fault : Normal fault and reverse fault, strike fault, dip fault, oblique fault, Hurst and graben. iii) Igneous intrusions – dyke and sill. **(03 Hrs)**
Unit-III	**:**	**River** – Long profile of river, stages of river, geological work of river, features associated with erosion and deposition of such valley, pot holes, meander and oxbow lake, waterfall delta formation, river rejuvenation, and river caption. **Earthquake** – Causes of earthquake, seismic waves, focus, epicenter, intensity and magnitude scale, isoseismal lines, seismograph and seismogram, locations of epicenter, effects of earthquake, earthquake zones of the earth. **(04 Hrs)**
Unit-IV	**:**	Building stones – Requirements of good building stones such as strength, durability, appearance, availability, field characters and its dependence on geological characters of rock. Factors affecting strength, building stones of India. **Landslides –** Definition of landslide, Rock fall, soil creeps. Angle of repose**, c**auses of landslide, stability of hill slopes, dip of bed and direction of slope.

		Preventive measures for landslides. **Core logging** – Diamond and calyx drill machine, inclined and large diameter drill hole, core recovery, rock quality designation, drill water loss, preservation of cores**.** **(07 Hrs)**
Unit-V	**:**	**Tunneling – Tunnel, Adit and Shaft.** Difficulties During Tunneling like seepage of groundwater, over break, Support during tunneling, lining after tunneling, rate of tunneling and influence of geological conditions on these. Tunneling through hard rock and soft rocks. Tunnels in folded strata, Tunnels across fracture zones, fault zones, Tunnels in closely jointed rocks, Tunnels in sedimentary rocks. **(04 Hrs)**
Unit-VI	**:**	**Various parts and types of dam –** Requirements of a good reservoir sites, requirements of a good dam site. Dependence on type of dam on geological conditions of the project site and availability of construction material. Dams on sedimentary rocks, dams in area of folded strata, dams on dyke, fracture, faults and on carbonate rocks. **(04 Hrs)**
Reference Books:	**:**	1. A Text of Engg. Geology - R.D. Gupte - Pune Vidyarthi Griha Prakashan. 2. Engineering Geology - Parbin singh 3. Engineering Geology - S.K.Garg - Khanna Publications – 5th edition 4. Structural Geology – Billings - Prentice 1-hall of India, New Dehli – 3rd edition 5. Geology of India – D.N. Wadia 6. Beginning Geology - H. K. Read and Janet Watson

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:

5. Minimum ten questions
6. Five questions in each section
7. 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.
8. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

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Syllabus of T. Y. B.Tech. Civil Semester-VI

Code No : CED 371 **Title : Lab-VI Design of structures-II**
Practical/ Term work : 2 Hrs/week
Teachers Assessment: 25 Marks.
Credits: 01 **Practical: 25 Marks**

Objectives	**:**	To understand actual working out quantities of various items of works including writing specification, rate analysis and actual procedure of contracts and tendering.
List of Practical	**:**	**Part A :-** TW shall consist of detailed design and drawing based on structural planning and designing of R.C.C residential/ public building (G + 1) by limit state method. It shall include analysis and design of all structural members as per IS -456 -2000. The drawing shall be submitted on at least three full imperial size sheets. **Part B: -** Any of the above two structural components must be designed by the latest R.C.C design software like STAAD etc. Programmes may also be developed using excel. Practical. Exam. Shall consist of sketching and Viva-voce based on the designing and drawing work done during the term.
Reference Books		**Reference Books** 1. IS-456-2000 2. SP-16 3. Hand book of concrete reinforcement & detailing —SP-66 4. Illustrated design of R.C. design DR. Shah & Karve 5. Manuals of R.C.C.design software like STADD etc.

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

- Continuous assessment
- Oral examination conducted on the syllabus and term work mentioned above

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Syllabus of T. Y. B. Tech. (Civil Engineering) Semester- VI

Code No.: CED372 **Title: Lab VII Environmental Engineerig-I**
Teaching Scheme : **Teachers Assessment: 25 Marks**
Practical/Term work: 02Hrs/week **Practical/Oral Examination : 25 Marks**
Credits:01

Objectives	**:**	The objective of this subject is student should be able to analyze the various parameters of water for different purposes particularly for drinking purposes.
Projects	**:**	1. Water quality analysis for the following parameters • pH • turbidity • alkalinity • chloride • hardness • nitrogen & fluoride • sulphate 2. Detailed design of Water supply system 3. Visit to water treatment plant

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

- Continuous Assessment
- Performing the experiment given in Laboratory

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Syllabus of T. Y. B. Tech. (Civil Engineering) Semester- VI

Code No.: CED373 **Title: Lab I Water Resources Engineering-II**
Teaching Scheme : **Teachers Assessment: 25 Marks**
Practical/Term work: 02Hrs/week **Practical/Oral Examination : 25 Marks**
Credits:01

Objectives	**:**	The objective of this subject is student should be able to design the of various types of Dams with various capacities and design of minor irrigation works.
Projects	**:**	1. reservoir storage capacity. 2. economic life of dam. 3. stability of gravity dams 4. principal stresses in gravity dams.. 5. phreatic line location in earth dams. 6. design of ogee shaped spillway. 7. Bligh's theory and Khosla's theory. 8. Theoretical assignment on minor irrigation works. 9. Theoretical assignment on hydroelectric power plant. 10. A visit to Dam/.Weir,/ Hydroelectric power plant.

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

- Continuous Assessment
- Performing the experiment given in Laboratory

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
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Syllabus of T. Y. B.Tech.Civil Semester-VI

Code No : CED374
Title : Lab IX Engineering Geology

Teachers Assessment: 25 Marks.

Practical / Term Work: 2 Hrs/week **Credits: 1**

Course Objectives	**:**	Since every civil engg. structure is located on or within the crust of the earth, to eucate the student of civil engg about the direct bearing of geological conditional of project site on the stability, economics & life of civil engg structure.
List of Practical	**:**	The term work shall consist of a record of laboratory experiments as mentioned below: 1] Mineralogy:-Study of physical properties of minerals 2] Study and identification following minerals and ores. Quartz, Rock crystals, Amethyst, Rosy quartz, Agate, Chaleedony Orthoclase, plagioclase, Zeolites, Biotite,Muscovite, Olivine, Hornblende,Augite, Serpentite, Talc, asbestos, chlorite, calcite, gypsum, bauxite, hematite, magnetite, gaphite. 3] study of mineral composition .texture, classification of igneous rocks.a Study and identification of following igneous rocks. Granite, pink granite, porphyritic granite, syenite, diorite, gabbro, pegmatite, dolerite, rhyolite, trachyte, andesite, compact basalt, amygdaloidal basalt, vesicular basalt, porphyritic basalt, giant phenocryst basalt, tachylite, volcanic braccia, hydrothermally altered basalt. 4] study and classification of secondary and sedimentary rocks. Study and characteristic of secondary rocks. Study and identification of following secondary rocks. Laterita, conclomerate, bracia, sandstone, ferruginous sandstone, quartzite, calcareous sandstone, shale, mudstone, cuddapah, , kola limestone, Shahabad limestone, coral, shelly limestone. 5] study and types of structures of metamorphic rocks. study and identification of following metamorphic rocks. Shale, phyllite, hornblende, schist, biotite schist, muscovite schist, mica schist, talc schist, chlorite schist, granite gneiss, banded granite gneiss, white marble, pink marble, serprntine marble. 6]study of geological maps and drawing vertical section of map no.1-simply dipping beds. 6 to 10-study of five geological maps with simply dipping, with strike fault, with dip fault and with engineering problems related to selection of dam site, location of tunnel , stability of hill slopes. Drawing and vertical geological sections of each step.
Reference Books		1. A Text of Engg. Geology - R.D. Gupte - Pune Vidyarthi Griha Prakashan. 2. Engineering Geology - Parbin singh 3. Engineering Geology - S.K.Garg - Khanna Publications – 5th edition 4. Structural Geology – Billings - Prentice 1-hall of India, New Dehli – 3rd edition 5. Geology of India – D.N. Wadia 6. Beginning Geology - H. K. Read and Janet Watson

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Syllabus of T. Y.B. Tech. civil Semester-VI

Code No:CED375 **Title: Lab-X (Project-I)**
Teachers Assessment : 50 Marks

Practical/TW (Internal) : 2 Hrs/week

Credits: 01

Objectives	**:**	The practical implementation of theoretical knowledge gained during your study to till date is important for Engineering Education. The student should be able implement their ideas/real time industrial problem/ current application of their engineering branch which they have studied in curriculum. This will definitely help in building the confidence in the student what he has learnt theoretically. The dependent study of the state of the art topics in a broad area of his/her specialization.

Guidelines for students and faculty:

1. Students have to finalize their project title based on Industrial Assignments.
2. The projects selected should be such so as to ensure the satisfaction of the urgent need to establish a direct link between education, national development and productivity and thus reduce the gap between the world of work and the world of study. The term work will consist of a report prepared by the student on the project allotted to them.
3. Project topics may be chosen by the student or group of students (maximum 3 students) with advice from the faculty members.
4. To design a project at adequate scale level for the following applications- It may be based (i) Entirely on study and analysis of a typical Instrumentation and Control System, (ii) Experimental verification, or (iii) Design, fabrication, testing and calibration of an Instrumentation system. The software based project can be considered based on its application for instrumentation and control purpose. The students are required to submit the report based on project work done.
5. Use appropriate tools (Microsoft Word/Latex)for the preparation of the report.
6. Each student/group is required to-
    c. Submit a one page synopsis before the project talk for display on the notice board in the first week of their academic semester.
    d. Give a 10 minutes presentation through OHP, PC, and Slide projector followed by a 10 minute discussion in the second week of their academic semester.
    e. Submit a report on the project topic with a list of required hardware, software or other equipment for executing the project in the third week of their academic semester.
    f. Start working on the project and submit initial development and CPM/PERT planning drawing in the fourth week of their academic semester.
    g. Preparation of PCB layout, wiring diagram, purchase of components, software demo, flowchart, algorithm, program/code, assembling, testing, etc. should be submitted by student/s within next five/Six weeks and minimum one page report should be there for each major activity.
    h. Overall assembling, wiring, code writing, testing, commissioning, should completed within next two weeks.

i. At the last but one week of end of academic semester the internal assessment of project will be done by panel of internal faculties and they will decide marks out 25 marks for term work (TA).
j. In the last week, student/group will submit final project report to guide and thereafter guide will finalize marks out of the remaining 25 marks for term work (TA).

7. Projects are to be scheduled in the weekly scheduled time-table during the semester and any change in schedule should be discouraged.
8. Every assigned faculty/s should maintain separate file for evaluating progress of each student or group.
9. Award 50 TA, Sessional marks based on the assessment done by internal guide and panel during semester and the involvement of student/group in the work assigned related to the topic and its application.

10. The format and other guidelines for the purpose of the Project Submission in hard bound copies should be as follows,

- Report Structure

Index/Contents/Intent

List of Abbreviations

List of Figures

List of Graphs

List of Tables

and List of if any other inclusion

1. Introduction

2. Literature survey

3. System development

4. Performance analysis

5. Conclusions

References

Appendices

Acknowledgement

1. INTRODUCTION

1.1 Introduction

1.2 Necessity

1.3 Objectives

1.4 Theme

1.5 Organization

2. LITERATURE SURVEY

Related information available in standard Books, Journals, Transactions, Internet Websites *etc*. till date (More emphasis on last three to five years)

3. SYSTEM DEVELOPMENT

Model Development

Analytical

Computational

Experimental

Mathematical

Statistical

(Out of above methods at least one method is to be used for the model development)

Some mathematical treatment or related information is required to be embodied

4. PERFORMANCE ANALYSIS

Analysis of system developed either by at least two methods depending upon depth of standard

These methods normally used are Analytical /Computational/Statistical/Experimental/ or Mathematical

Results at various stages may be compared with various inputs

Output at various stages with same waveforms or signals or related information/parameters

Comparison of above results by at least two methods and justification for the differences or error in with theory or earlier published results

5. CONCLUSIONS

5.1 Conclusions

5.2 Future Scope

5.3 Applications

Contributions (if any,)

The innovative work/invention/new ideas generated from the analysis of the work which can be taken from the conclusions

References

Author, “Title”, Name of Journal/Transactions/ Book, Edition/Volume, Publisher, Year of Publication, page to page (pp.__).

These references must be reflected in text at appropriate places in square bracket

In case of web pages complete web page address with assessing date has to be enlisted

List of references should be as per use in the text of the report

Appendices

Related data or specifications or referred charts, details computer code/program, *etc*.
(1 Page)

Expression of gratitude and thankfulness for helping in completion of the said task with name

Signed by the candidate

- General Guidelines
  Text should be printed on front and correct side of the watermark on quality bond paper

  Paper size- A4, 75 to 85 gsm paper

  Left Margin-1.5”

  Right Margin-3/4”

  Top Margin-1”

  Bottom Margin-1”

- First page of first chapter need not be printed anywhere ,second page onwards at right hand corner at ½ inch from right and top side from second chapter onwards starting page number of chapter should be printed at bottom center place report total pages –around.
  All Greek words must be italic

  Report Heading -All Capital—16 Font

  Chapter heading -All Capital—14 Font

  Subchapter –title case-12 Font

  Sub-Subchapter –First Alphabet Capital case-12 Font

Page numbers for Index/Contents/Intent should be in roman

Title of the Report should not be more than two lines

Text pages should be in times new roman

The page of the Index/Contents/Intent heading should be below the words for appropriate sub chapter or sub-sub chapter as shown in sample copy

Cover page should have (Mission statement of Institute) in inverted commas, Symbol of Institute, Name of Department, and Institute

Suitable flap with name of the candidate, Department and Institute name and symbol can be used with nylon strip.

For more information and sample of hard copy please contact the respective Head of the Department