

Course Title: STRUCTURAL ENGINEERING LAB-I (Code: CIV- 301 P)	Syllabus for B.Tech. 3rd Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

- CO1** To understand the behavior of structural members/elements under loading.
- CO2** To understand the properties of structural members so that one can judge at a glance safety and usage of a given structure.
- CO3** To determine crippling load of columns with different end conditions.
- CO4** To measure the ultimate shear strength.

S No	Name of experiment	Objective
1	Tensile Test of Steel	To determine yield strength, ultimate tensile strength, percentage elongation and modulus of elasticity (Plot, stress strain curve).
2	Tensile and Compressive strength of Timber	i. Parallel to grains ii. Perpendicular to grains.
3	Shear test of steel/timber	To measure ultimate shear strength. Shear modulus. Plot shear stress strain Curve.
4	Torsion test of steel	To measure angle of twist. Ultimate Torsional strength stress strain Curve.
5	Buckling load of columns various end conditions.	To determine crippling load of columns with different end conditions and compare theoretical values.
6	Verification of Maxwell's Theorem.	To verify the Principle of Maxwell's theorem
7	Testing of Bricks and Stones as per IS Specifications.	
8	Verification of horizontal thrust in a three hinged arch	To evaluate experimentally horizontal thrust in a three hinged arch and draw influence line diagram for the horizontal thrust

Course Title: FLUID MECHANICS LAB-I (Code: CIV- 302 P)	Syllabus for B.Tech. 3rd Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

- CO1 To develop understanding about hydrostatic law, principle of buoyancy and stability of a floating body and application of mass, momentum and energy equation in fluid flow.
- CO2 To imbibe basic laws and equations used for analysis of static and dynamic fluids.
- CO3 To inculcate the importance of fluid flow measurement and its applications in Industries.
- CO4 To give fundamental knowledge of fluid, its properties and behavior under various conditions of internal and external flows.

1. To determine experimentally the metacentric height of a ship model.
2. To verify the Bernoulli's equation experimentally.
3. To determine the coefficient of discharge, coefficient of velocity and coefficient of contraction of an orifice or a mouthpiece of a given shape.
4. To calibrate an orifice meter and to study the variation of coefficient of discharge with Reynold's number.
5. To calibrate a venturimeter and to study the variation of coefficient of discharge with Reynold's Number.
6. To calibrate sharp crested rectangular and triangular weir.
7. To verify momentum equation experimentally.

Course Title: SURVEYING LAB-I (Code: CIV- 303 P)	Syllabus for B.Tech. 3rd Semester (Civil Engineering)	Total Course Credit: 2		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	4

- CO1** To handle and use basic surveying equipment viz., chain/ Tape, compass. Prepare layout plans.
- CO2** To measure angles and bearings..
- CO3** To handle and use plain table, and level.
- CO4** To handle and use level. Preparation of L –sections and X-sections showing relative levels of various points

Unit No.	Course Contents	Lecture Hours
Unit -1	Introduction: Importance, Principles of Surveying. Types of Surveying.	4
	Chain Surveying: Field Equipment, Methods of chaining, Offsets, Correction in chaining, Obstacles in chain-surveying; plotting Degree of accuracy. Tape and chain corrections	7
Unit -2	Prismatic compass surveying. Instruments; Principle, Procedure and precautions, Closed traverse; Corrections, Local attraction, Plotting	6
	Plane Table Surveying; Field equipments, Methods of plane tabling, Two point and Three point problem, Precautions, Accuracy	6
Unit -3	Levelling; Instruments; Field book recording, Bench Mark and its types, Methods of reduction of levels, Various types of field works,	9

	Areas and Volumes: Methods of determining areas and volumes viz., Borrow - pits.	4
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Course Title: FLUID MECHANICS LAB-II (Code: CIV- 402 P)	Syllabus for B.Tech. 4th Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

S. No.	Contents	Contact Hours
1	To find friction factor for pipes of different materials.	3
2	To determine the minor head loss coefficient for different pipe fittings.	3
3	To determine the surface profile and total head distribution of a vortex.	3
4	To determine the elements of a hydraulic jump in a rectangular channel.	3
5	To determine the Manning's rugosity coefficient of a laboratory flume.	3
6	To obtain the velocity distribution for an open channel and to determine the values of α , β and n .	3
	Total	18

Course Title: SURVEYING LAB-II (Code: CIV- 403 P)	Syllabus for B.Tech. 4th Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

Unit No.	Course Contents	Lecture Hours
Unit -1	a. Study of Equipment: Ordinary Theodolites, E D M Theodolites and G T S Theodolites.	15
	a. Temporary Adjustments of a Theodolite.	
	b. Field work using a Theodolite: (i). Measurement of Horizontal and Vertical Angles by ordinary and electronic Theodolites. (ii). Measurement of linear and angular measurements using EDM/GTS Instruments (Basic Introduction)	
Unit -2	a. TACHEOMETRIC SURVEYING: (i) Study of equipment and graduated staff. (ii) Temporary adjustment	15
	b. Field work: (i). Determination of Constants " K & C " (ii). Stadia Traversing & recording stadia field book (iii). Location of Details by Tacheometric Methods	
	a. Subtense Bar Method: Theory and Field work	
	Total	30

Course Title: CONCRETE LAB (Code: CIV- 501 P)	Syllabus for B.Tech. 5th Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

- CO1** To handle concrete and its constituents in laboratory.
- CO2** To design experiments related to testing various aspects of concrete and its constituents.
- CO3** To test concrete and concrete structures for various characteristics/properties and compare the same with those given as per IS codes.
- CO4** To understand how concrete behaves in actual buildings.

List of Experiments / Objective

A) CEMENT: Standard Consistency and setting times To determine: i) Standard consistency ii) Initial setting time iii) Final setting time in conformity with IS code 4031.

Tensile and Compressive strength

i)

To determine the tensile strength and compressive strength of Cement in accordance with IS code - 4031.

B) AGGREGATES:

Particle size distribution and fineness modulus

i) To determine the particle size distribution and fineness modulus of coarse and fine aggregates (IS - 460). All the relevant tests for aggregates as per I.S. codes.

C) CONCRETE:

Workability test

- i) To determine the consistency of fresh concrete by slump test.
- ii) To determine the workability of freshly mixed concrete by the compaction factor test

Compressive strength of Cement Concrete (Nominal mix)

- i) To determine the cube strength of concrete for different mixes and different W/C ratios.

Flexural Strength of Concrete

i) To determine the flexural strength (Modulus of Rupture) of concrete (Nominal Mix)

Ultimate strength of Beams

To determine the flexural ultimate strength of

- i) an under reinforced beam
- ii) an over reinforced beam

Bond strength

To determine the bond strength between

- i) Mild steel plain bars & concrete
- ii) Tor Steel/cold twisted bars and concrete

Course Title: HIGHWAY LAB (Code: CIV- 502 P)	Syllabus for B.Tech. 5th Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

- CO1** Conduct tests on aggregate; aggregate gradation, specific gravity, aggregate crushing, aggregate abrasion, aggregate impact: follow standard test procedures, design observation sheet, record observations and analyze, presentation and analysis of test results, derive conclusions
- CO2** Conduct tests on aggregate; soundness, flakiness, elongation, combined flakiness & elongation, deleterious material: follow standard test procedures, design observation sheet, record observations and analyze, presentation and analysis of test results, derive conclusions
- CO3** Conduct tests on coarse and fine aggregate and bitumen; fineness modulus, silica content, organic content, silt content, alkalinity, viscosity; penetration, softening point, flash & fire point, ductility, specific gravity,: follow standard test procedures, design observation sheet, record observations and analyze, presentation and analysis of test results, derive conclusions
- CO4** Conduct tests on modified binders, bituminous Mixes and subgrade soil; elastic recovery, separation difference, Marshall stability, flow value, index properties of soil, CBR of soil, subgrade modulus: follow standard test procedure, design observation sheet, record observations and analyze, presentation and analysis of test results, derive conclusions

Expt. No	Contents
1	Tests on aggregate: Aggregate grading, Specific gravity, crushing, Abrasion, Impact test, Soundness, Flakiness, Elongation, Fineness Modulus, Silica content, Organic content, Silt content, Alkalinity, Deleterious material.
2	Tests on bitumen and bituminous mixes: Viscosity, Penetration, Softening point, Flash & fire point, Ductility, Specific gravity, Elastic recovery, Marshall Stability.
3	Tests on subgrade: sub-grade modulus, CBR.

Course Title: GEOTECHNICAL LAB- I (Code: CIV- 503 P)	Syllabus for B.Tech. 5th Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

COURSE OUTCOMES:

1. To determine basic soil properties and consistency limits.
2. Draw complete particle size distribution curve of a given soil.
3. Determine Compaction characteristics of a given soil.
4. Determine Permeability of any given soil specimen.

Expt. No.	Name of the Experiment
1	Soil Identification Tests
2	Water Content Determination Test
3	Field Density Measurement
4	Specific Gravity Test
5	Sieve Analysis Test
6	Sedimentation Analysis Test
7	Atterberg And Shrinkage Limits
8	IS Light Heavy Compaction Tests
9	Permeability Tests

Course Title: STRUCTURAL ENGINEERING LAB- II (Code: CIV- 601 P)	Syllabus for B.Tech. 6th Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

- CO1** Ability to demonstrate professional engineering approach, including application of principles and utilization of technical resources such as software's towards solving technical problems requiring civil engineering interventions.
- CO2** Ability to furnish and/or analyse designs and construct structural systems, produce related documents, drawings and reports, and present objective estimates of the related quantities.
- CO3** Ability to conduct field and laboratory investigations pertaining to civil engineering domain, and utilize modern tools and techniques of surveying.
- CO4** To understand the behaviour of structural members

Name of the experiment:

Expt. No	Contents
1.	Deflection of curved beams
2.	Behaviour of a portal frame under different load combinations
3.	Deflection of Truss
4.	Behaviour a cantilever beam under symmetrical and un-symmetrical loading
5.	Analysis of an elastically coupled beam
6.	Analysis of a redundant joint
7.	Analysis of two hinged arch

Course Title: TRAFFIC ENGINEERING LAB- II (Code: CIV- 602 P)	Syllabus for B.Tech. 6th Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

- CO1** To understand the road user/ driver characteristics in Lab, traffic volume studies in field, intersection volume studies in field: design of questionnaires, data collection, compilation and analysis of field and lab data, presentation of results and derive conclusions
- CO2** To perform small-network volume studies and OD volume studies: design of questionnaires, data collection, compilation and analysis of field and lab data, presentation of results and derive conclusions
- CO3** To understand the traffic speed (spot speed) studies, conduct of travel-time & delay studies, accident studies: design of questionnaires, data collection, compilation and analysis of field and lab data, presentation of results and derive conclusions
- CO4** To understand and perform pedestrian and parking studies: design of questionnaires, data collection, compilation and analysis of field and lab data, presentation of results and derive conclusions.

Expt.No	Contents
1	Study of Road user characteristics
2	Traffic volume studies
3	Intersection volume studies
4	Small-network volume studies
5	OD volume studies
6	Study of traffic speed
7	Speed & delay studies
8	Travel-time studies
9	Accident studies
10	Pedestrian studies
11	Parking studies

Course Title: GEOTECHNICAL ENGINEERING LAB- II (Code: CIV- 603 P)	Syllabus for B.Tech. 6th Semester (Civil Engineering)	Total Course Credit: 1		
Internal Examination	External Examination	L	T	P
50 Marks	50 Marks	0	0	2

COURSE OUTCOMES

1. Determine consolidation characteristics of a given soil sample.
2. Obtain shear strength parameters of different types and/or consistencies of soils and under different drainage conditions.
3. Perform Standard Penetration test of soil to obtain SPT (N) – value.
4. Determine allowable soil pressure of soil foundation system by vertical plate load test.

Expt. No.	Name of the Experiment
1	Consolidation Test
2	Direct Shear Test
3	Unconfined Compression Test
4	Unconsolidated Undrained Triaxial Test
5	Vane Shear Test
6	Consolidated Undrained Triaxial Test
7	Standard Penetration Test
8	Plate Load Test

