BHARATI VIDYAPEETH (Deemed to be University)
COLLEGE OF ENGINEERING, PUNE- 43.
DEPARTMENT OF CIVIL ENGINEERING

Mapping of Experiments with COs B.Tech (Civil) -2014 Programme

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
Class: - B. Tech (Civil) Sem:- I	**Name of Course:-** Fundamentals of Civil Engineering						
1	Study and use of prismatic compass and measurement of bearings.	✓					
2	Study and use of Dumpy level and reduction of levels by collimation plane method.	✓	✓				
3	Area measurement by Digital Planimeter.	✓	✓				
4	Drawing plan and elevation of a residential bungalow	✓		✓			
5	Study of features of topographical maps	✓	✓				
6	Assignment on collection of information on Civil Engineering materials.	✓		✓			
7	Assignment on types of foundations.	✓			✓		
8	Assignment problem on irrigation and hydropower structures.	✓				✓	
9	Assignment on study of flow chart of water and sewage treatment.	✓				✓	
10	Assignments on types of transportation systems.	✓					✓
Class: - B. Tech (Civil) Sem: - I	**Name of Course:-** Computer Applications in Civil Engineering I						
1	Introduction to Microsoft Excel	✓					
2	Preparation of Excel Sheets with various solved equations.	✓	✓				
3	Graphical representation of different data.	✓	✓				
4	A mini project with Microsoft Excel	✓	✓				
5	Introduction to Microsoft PowerPoint			✓			
6	Preparation of slides.			✓			
7	Insertion of clipart, word-art, histograms, different shapes and various charts.			✓			
8	A mini project with Microsoft PowerPoint			✓			
Class: - B. Tech (Civil) Sem:- II	**Name of Course:-** Engineering Mechanics						
	PART-A						
1	Determination of reactions of Simple and Compound beam.	✓		✓			
2	Study of equilibrium of concurrent force system in a plane.	✓		✓			
3	Determination of coefficient of friction for Flat Belt.	✓	✓				
4	Determination of coefficient of friction for Rope.	✓	✓				

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
5	Study of Curvilinear motion.	✓		✓		✓	✓
6	Determination of Coefficient of Restitution.	✓			✓		✓
	PART-B						
7	Graphical Solution of Resultant	✓					
8	Graphical Solution of Truss	✓	✓				
9	Graphical Solution of Friction	✓	✓				
10	Graphical Solution of Motion Curve	✓			✓		
11	Graphical Solution of Impulse Momentum	✓			✓		✓
Class: - B. Tech (Civil) Sem:- II					**Name of Course:-** Building Construction		
	Plates-(1/4 imperial size)						
1	Symbols of Material & structures	✓	✓	✓	✓	✓	✓
2	Section of wall	✓					
3	Brick bonds - English bond, Flemish bond	✓					
4	Types of stone masonry	✓					
5	Arches - any three			✓			
6	Types of steel trusses - any three				✓		
7	Paneled Door & Flush doors		✓				
8	M.S. Window, Aluminum Window, Louvers Windows		✓				
9	Collection of information brochures related to Construction Material.	✓	✓	✓	✓	✓	✓
Class: - B. Tech (Civil) Sem:- III				**Name of Course:-** Building Planning Designs and Byelaws			
1	Preparation of working drawings of any one of the buildings listed below: a) Residential Building b) Commercial Building c) Educational Building d) Industrial Building e) Recreational Building f) Health Club	✓					
2	Sheets to be drawn a) Plan/Typical floor plan to a suitable scale. b) Elevation and section to a suitable scale. c) Site plan showing water supply and Drainage d) Foundation Plan to a suitable scale	✓	✓	✓			
3	Line plan of remaining five buildings.	✓	✓	✓			
4	Perspective Drawing of different objects.						✓
Class: - B. Tech (Civil) Sem:- III					**Name of Course:-** Applied Geology		
1	Identification of the Minerals	✓					

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
2	Identification of Igneous rocks	✓	✓				
3	Identification of Secondary rocks	✓	✓				
4	Identification of Metamorphic rocks	✓	✓				
5	Study of Contoured Geological Maps & drawing the sections	✓		✓			
6	Visit to site of Dam / Tunnel for understanding the geological features.	✓	✓	✓	✓	✓	✓
Class: - B. Tech (Civil) Sem:- III **Name of Course:-** Computer Applications in Civil Engineering II							
1	Introduction to the software: Tool bars, Symbols and Various Commands.	✓					
2	Drawing Plates (minimum 10 in number)	✓	✓				
3	Drawing Plan, Elevation and Section of G+1 Building.	✓	✓	✓			
Class: - B. Tech (Civil) Sem:- III **Name of Course:-** Testing of Materials							
1	Tension Test – Mild steel, Tor steel	✓					
2	Torsion test- Mild Steel	✓					
3	Direct Shear test- Mild Steel	✓					
4	Izod & Charpy Impact tests- Mild Steel, Aluminium, Brass, Copper	✓					
5	Rockwell Hardness test- Mild Steel, Aluminium, Brass, Copper	✓					
6	Standard consistency and Setting time test on cement		✓				
7	Fineness test on Cement		✓				
8	Compressive strength of Cement		✓				
9	Soundness test on Cement		✓				
10	Specific gravity of Aggregates			✓			
11	Fineness Modulus of Aggregate			✓			
12	Aggregate Impact Value`			✓			
13	Aggregate Crushing Value			✓			
14	Workability of Concrete & effect of admixture.				✓		
15	Compressive strength of Concrete				✓		
16	Flexural Test of Concrete				✓		
17	Split Tensile strength of Concrete				✓		
18	Non Destructive Test on concrete – Schmidth's Rebound hammer test				✓		
19	Bending test – Timber				✓		
20	Compressive Strength test- Bricks				✓		
Class: - B. Tech (Civil) Sem:- IV **Name of Course:-** Surveying							

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
1	Linear measurements with tape and accessories	✓					
2	Study and use of auto level and double check levelling		✓				
3	Compound leveling and fly leveling, calculation by rise and fall method.		✓				
4	Two peg test for level.		✓				
5	Study and use of 20" Vernier Theodolite						
6	Measurement of horizontal angle of triangle by repetition method and applying check.			✓			
7	Measurement of vertical angle by transit Theodolite			✓			
8	Trigonmetrical levelling by transit Theodolite.			✓			
9	Computation of horizontal distance and elevation of points by tachometry for horizontal and inclined sights.				✓		
10	Introduction and study of outfit of plane table and method of radiation.						✓
11	Intersection method of plane table survey						✓
12	Closed plane table traverse survey around a small four sided building.						✓
13	Setting out simple circular curve by Rankin's method of deflection angle					✓	
14	Use of laser based electronic range finder.	✓	✓	✓			
15	Project No:- I Road project of minimum length of 250 M including fixing of alignment, profile leveling and cross sectioning	✓	✓				
16	Project No:- II Theodolite traverse survey of closed traverse for minimum 0.5 hectares area including building roads etc	✓		✓			
Class: - B. Tech (Civil) Sem:- IV				**Name of Course:-** Mechanics of Fluids			
1	Determination of Viscosity	✓					
2	Study of Pressure Measuring Devices	✓					
3	Study of Stability of Floating Bodies	✓					
4	Verification of Bernoulli's Theorem	✓	✓		✓		✓
5	Determination of C_d of Venturimeter	✓	✓				
6	Determination of C_d of Orifice	✓	✓	✓	✓		
7	Determination of C_d of Notch	✓	✓				
8	Study of Laminar flow Using Heleshaw's Apparatus	✓			✓	✓	

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9	Study of Laminar flow Using Reynold's Apparatus	✓			✓		✓
Class: - B. Tech (Civil) Sem:- IV **Name of Course:-** Computer Applications in Civil Engineering III							
1	Analysis of beams	✓					
2	Analysis of plane frames		✓		✓		
3	Analysis of plane trusses			✓	✓		
Class: - B. Tech (Civil) Sem:- IV **Name of Course:-** Civil Engineering Construction Practice							
1	Setting out and layout of building foundation.	✓				✓	
2	Study of various types of drawings required on construction sites					✓	
3	Study of reinforcement and its bending for different structural members.		✓		✓	✓	
4	Slump test on concrete and effect of plasticizers.		✓		✓	✓	
5	Study of formwork& scaffolding.		✓		✓	✓	
6	Construction of different types of brick masonry bonds, study of recent types of bricks and blocks		✓		✓	✓	
7	Study of plastering & pointing.		✓		✓	✓	
8	Study of different types of tiles.		✓		✓	✓	
9	Introduction to water supply & sanitary fittings and appliances.		✓		✓	✓	
10	Concealed construction practices.		✓		✓	✓	
11	Types of paints.		✓		✓	✓	
12	Methods of Waterproofing of toilets & roofs.		✓		✓	✓	
13	Testing of concrete cubes of different grades.		✓		✓	✓	
14	Study of stock register format and daily report.			✓		✓	
15	Study of construction of concrete walls.		✓		✓	✓	
16	Study of precast techniques.					✓	
17	Study of Deck Slab.					✓	

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18	Study of Advance Water proofing Techniques					✓	
Class: - B. Tech (Civil) Sem:- V		**Name of Course:-** Structural Design I					
	PART-A						
	Project -Design of Roof Truss / Design of Building						
1	Structural configuration	✓	✓				
2	Load Calculation	✓	✓	✓	✓	✓	✓
3	Analysis of structure	✓					
4	Evaluate Design Load	✓		✓	✓	✓	✓
5	Design of Members	✓		✓	✓	✓	✓
6	Design of Connection	✓	✓	✓			
7	Drawing	✓	✓	✓	✓	✓	✓
	PART-B						
1	Site Visit	✓	✓	✓	✓	✓	✓
Class: - B. Tech (Civil) Sem:- V		**Name of Course:-** Advanced Surveying					
1	Study and use of one second theodolite and measurement of horizontal angle	✓					
2	Measurement of horizontal angles by reiteration method and Measurement of vertical angle.	✓					
3	Study and use of total station.		✓				
4	Study and use of total station for traverse survey.		✓				
5	Applications of Total Station for REM, RDM		✓				
6	Study and Use of Nautical Sextant for measurement of horizontal angles.				✓		
7	Study and Use of Mirror stereoscope to find air base distance						✓
8	Study and use of parallax bar and determination of difference in elevation by differential parallax.						✓
9	Adjustment of braced Geodetic quadrilateral	✓					
10	Study and use of Handheld GPS for traverse survey			✓			
11	Solution of three point problem in hydrographic surveying				✓		
12	Study of GIS software.					✓	
Class: - B. Tech (Civil) Sem:- V		**Name of Course:-** Engineering Project Management					
1	Assignment on different types of organization and their flowcharts.	✓					

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
2	Assignment on bar chart.		✓				
3	Assignments on C.P.M. and P.E.R.T.`		✓				
4	Assignment on resource levelling.			✓			
5	Assignment on crashing of network.			✓			
6	Assignment on updating of network.			✓			
7	Assignment on ABC and EOQ analysis.				✓		
8	Assignment on linear programming, graphical and simplex method.					✓	
9	Study of quality control system of a construction project.	✓	✓	✓			✓
10	Prepare a network for any construction project containing minimum 25 activities and find out total float and free float.		✓				
Class: - B. Tech (Civil) Sem:- V **Name of Course:-** Advanced Mechanics of Fluid							
1	Flow around aerofoil.					✓	
2	Flow around a Circular Cylinder.					✓	
3	Impact of jet around flat / curved plate.				✓		✓
4	Performance Curves of Hydraulic Turbine. Constant Head Characteristic Curve				✓	✓	✓
5	Characteristics of Centrifugal Pump.						✓
6	Uniform flow formulae of open channel.	✓	✓	✓	✓		
7	Velocity distribution in open channel flow.	✓	✓	✓			
8	Hydraulic jump as energy dissipater.	✓		✓		✓	
9	Characteristics of various GVF profiles.	✓	✓	✓			
10	Design of Hydraulic Centrifugal Pump.						✓
11	Design of Hydraulic Turbine.				✓	✓	✓
12	GVF Computations by Direct Step Method.		✓	✓			
Class: - B. Tech (Civil) Sem:- VI **Name of Course:-** Structural Design II							
1	Design of G+2 storied building for gravity loads only. The design should include all types of slabs, beams, columns, footings and staircase (two flights)	✓	✓	✓	✓	✓	✓
2	Report of a site visit related to building structure under construction	✓	✓	✓	✓	✓	✓
Class: - B. Tech (Civil) Sem:- VI **Name of Course:-** Environmental Engineering I							
1	Determination of pH and alkalinity of water samples	✓	✓	✓			
2	Determination of Total Hardness and its components of water samples	✓	✓	✓			
3	Determination of Chlorides of water samples	✓	✓	✓			

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
4	Determination of Turbidity and optimum dose of alum for raw water samples.	✓	✓	✓			
5	Determination of Optimum dose of chlorine and residual chlorine for water samples.	✓	✓	✓			
6	Determination of calorific value and/or energy content of the solid waste.					✓	
7	Determination of concentration of trace metals (Al, Mn, Cu, Ni, Zn, Pb, Cd, Fe, N, P. K) from water, solid waste, air and soil samples.					✓	
8	Determination of PM 2.5 in ambient air samples.				✓		
9	Determination of concentration of Particulate matter and gaseous pollutants in industrial stack.				✓		
10	Determination of concentration of carbon di-oxide from ambient air/industry/automobile				✓		
11	Site visit	✓	✓	✓	✓	✓	✓
12	Study of EIA report of infrastructure project.						✓
Class: - B. Tech (Civil) Sem:- VI		**Name of Course:-** Estimation, Costing and Valuation					
1	Estimate of different structures using long wall short wall method and centre line method		✓	✓			
2	Detailed estimate of a single storied R. C. C. framed building using D.S.R. rates	✓					
3	Working out quantities of steel reinforcement for a slab, a beam, column footing and preparing bar bending schedule.	✓	✓	✓			
4	a) Detailed estimate of roadwork . b) Assignment on road earthwork calculations.			✓			
5	Estimating quantities for any two of the following a) House drainage & water supply arrangement. b) Pipe culvert or slab culvert c) Septic tank.	✓	✓	✓			
6	Drafting detailed specifications of any five items .		✓				
7	Assignment on valuation of building. (O1 form)				✓		
8	Preparation of draft tender notice.					✓	✓

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
9	Rate analysis for any five items.			✓			
Class: - B. Tech (Civil) Sem:- VI		**Name of Course:-** Geotechnical Engineering					
1	Determination of water content by oven drying method	✓	✓				
2	Determination of specific gravity of coarse and fine grained soil	✓	✓				
3	Classification of soil by sieve analysis		✓				
4	Determination of consistency limits – Liquid, plastic and shrinkage limit		✓				
5	Determination of in situ density test – Core cutter and sand replacement method	✓	✓				
6	Determination of coefficient of permeability by – a) Constant Head Method b) Falling Head Method		✓	✓			
7	Determination of OMC and MDD by Standard Proctor Test and Modified Proctor Test	✓	✓		✓		
8	Determination of shear parameters by Direct Shear Test					✓	
9	Determination of Unconfined Compression Strength of soil					✓	
10	Determination of shear parameters Triaxial Shear Test					✓	
11	Determination of shear parameters Vane Shear Test					✓	
Class: - B. Tech (Civil) Sem:- VII		**Name of Course:-** Structural Design III					
	PART-A						
	Project -Design of any Three topics						
1	Design of post-tensioned simply supported beams flexure and shear with check for deflection.	✓	✓				
2	Design of flat slab.			✓			
3	Design of retaining walls (T or L).				✓		
4	Design of slab type rectangular combined footing.					✓	
5	Design of Circular water tank.						✓
	PART-B						
1	Site Visit	✓	✓	✓	✓	✓	✓
Class: - B. Tech (Civil) Sem:- VII		**Name of Course:-** Environmental Engineering					
1	**Determination of** Solids -Total solids, suspended solids, volatile solids, settleable solids & non-settleable solids, Total Dissolved solids, Fixed Solids.	✓	✓	✓			

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
2	**Determination of** Dissolved oxygen			✓	✓		
3	**Determination of** Bio-Chemical Oxygen Demand	✓	✓	✓	✓	✓	
4	**Determination of** Chemical Oxygen Demand	✓	✓	✓	✓	✓	
5	**Determination of** Electrical Conductivity of waste water samples			✓			
6	**Determination of** Phosphates from waste water samples by spectrophotometer			✓			
7	**Determination of** Nitrates from waste water samples by spectrophotometer			✓			
8	**Determination of** heavy metals from waste water samples like Cr^{6+} or Zn or Ni or Cd			✓			
9	**Determination of** total nitrogen from waste water samples by Kjeldhal method			✓			
10	Visit to domestic / Industrial wastewater treatment plant & its detailed reports	✓	✓	✓	✓	✓	
11	Computer aided design of Sewage Treatment Plant (STP) OR Effluent Treatment Plant (ETP) of Sugar or Dairy Industry using suitable software (C programming or any other suitable software)	✓	✓	✓	✓	✓	✓
Class: - B. Tech (Civil) Sem:- VII **Name of Course:-** Computer Applications in Civil Engineering- IV							
	Design of RCC Framed Building using FEM software						
1	Modelling of building frame	✓					
2	Analysis of Building frame and calculation of design forces in the members	✓	✓				
3	Design of RCC Framed Building.		✓	✓			
Class: - B. Tech (Civil) Sem:- VII **Name of Course:-** Project Stage I							
1	Defining the topic of the project, scope of the project and experimental and design work involved	✓	✓				
2	Completing the literature review and methodology pertaining to the topic selected.			✓	✓		
3	A report / term work is to be prepared on work done in stage I					✓	✓
Class: - B. Tech (Civil) Sem:- VII **Name of Course:-** In Plant Training for 45 Days							
	In view of getting exposure to industry / site / design office, a student has to	✓	✓	✓	✓	✓	✓

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	undergo the inplant training for 6 weeks / 45 days in one of the Civil Engineering areas. The training may consist of any one or more of the following:						
1	Working on any site with substantial work related to Civil Engineering	✓	✓	✓	✓	✓	✓
2	Working in any design office with work related to Civil Engineering Design	✓	✓	✓	✓	✓	✓
3	Working in any Civil Engineering industry / Government organisation / research organisation	✓	✓	✓	✓	✓	✓
Class: - B. Tech (Civil) Sem:- VIII **Name of Course:-** Earthquake Resistant Design of Structures							
1	projects on determinations of Earthquake forces using static method	✓		✓			
2	projects on determinations of Earthquake forces using dynamic method	✓	✓		✓		
3	project on design of shear wall.	✓	✓			✓	✓
Class: - B. Tech (Civil) Sem:- VIII **Name of Course:-** Water Resources Engineering							
1	Marking the catchment area for a given reservoir site on topographical maps and Estimation of Mean precipitation for given catchment area.	✓					
2	Estimation of reservoir capacity by mass curve method				✓		
3	Design a flood hydrograph from a given unit hydrograph.			✓			
4	Site Visit to water resources project				✓	✓	✓
5	Stability analysis of gravity dam.				✓		
6	Stability analysis of Earth dam					✓	
7	Hydraulic design of spillway and energy dissipation arrangement.						✓
8	Study and draw typical layout of high head hydropower plant.						✓
Class: - B. Tech (Civil) Sem:- VIII **Name of Course:-** Infrastructure Engineering							
1	Aggregate Impact Test			✓			
2	Los Angeles Abrasion Test			✓			
3	Crushing Test on Aggregates			✓			
4	Flakiness Index and Elongation Index			✓			
5	Specific Gravity and Water Absorption Test			✓			

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
6	Bitumen Stripping Value Index			✓			
7	Use of Anti Stripping Compound			✓			
8	Specific Gravity of Bitumen			✓			
9	Penetration Test of Bitumen			✓			
10	Ductility Test of Bitumen			✓			
11	Softening point test of Bitumen			✓			
12	Viscosity test of Bitumen			✓			
13	Flash and Fire Point Test of Bitumen			✓			
14	Benkelman Beam Test			✓			
15	Marshall Stability Test			✓			
16	California Bearing Ratio Test			✓			
Class: - B. Tech (Civil) Sem:- VIII **Name of Course:-** Elective III Solids Waste Management							
Site Visit							
1	Bharati Vidyapeeth Medical Hospital Biomedical Waste		✓				
2	PMC Bio-methanization plant	✓	✓				
3	PMC MSW Processing plant			✓			
4	PMC MSW Transfer Station				✓		
5	PMC MSW Landfill site					✓	
6	SWM in Society						✓
Class: - B. Tech (Civil) Sem:- VIII **Name of Course:-** Elective III Advanced Engineering Geology with Rock Mechanics							
1	Construction of Geological section for dam site using drilling data	✓	✓	✓			
2	Construction of Geological section and locating fault by angle holes.	✓	✓	✓			
3	Construction of Geological section and limitation for drilling.	✓	✓	✓			
4	Dams on Deccan trap rocks.			✓			
5	Tunnels and road cuts in folded sedimentary rocks.				✓		
6	Tunneling in Deccan trap rocks				✓		

S.N	Title of Experiment	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6
7	A report to be prepared on actual site visit for Major Civil Engineering Structures.	✓	✓	✓	✓	✓	✓
Class: - B. Tech (Civil) Sem:- VIII		**Name of Course:-** Project Stage II					
1	Experimentation /design /model work of the problem/ topic defined in Stage-I.	✓	✓				✓
2	observations, results and conclusions of the problem/topic			✓	✓	✓	✓