

DEPARTMENT OF CIVIL ENGINEERING  
Dr.B.R.AMBEDKAR GOVT. POLYTECHNIC AMBOTA , UNA (H.P)  
LESSON PLAN FOR CONSTRUCTION MATERIALS (SEMESTER-3rd) SESSION: (Aug. - Dec.,2024)

Sr. No.	MONTH	WEEK	CONTENTS	REMARKS
1	AUGUST	Week-1 (1-3 Aug.)	Overview of Construction Materials: Scope of construction materials in Building Construction, Transportation Engineering, Environmental Engineering, Irrigation Engineering (applications only)	
		Week-2 (5-9 Aug.)	Selection of materials for different civil engineering structures based on strength, durability, Eco friendly and economy. Broad classification of materials – Natural, Artificial, special, finishing and recycled	
		Week-3 (12-17 Aug.)	Natural Construction Materials: Requirements of good building stone, general characteristics of stone, quarrying and dressing methods and tools for stone, Structure of timber, general properties and uses of good timber, different methods of seasoning for preservation of timber, defects in timber, use of bamboo in construction	
		Week-4 (19-24 Aug.)	Asphalt, bitumen, and tar used in construction, properties and uses. Properties of lime, its types and uses.	
		Week-5 (26-31 Aug.)	Types of soil and its suitability in construction. Properties of sand and uses. Classification of coarse aggregate according to size	
2	SEPTEMBER	Week-1 (1-7 Sep.)	Artificial Construction Materials: Constituents of brick earth, Conventional / Traditional bricks, Modular and Standard bricks. Special bricks – fly ash bricks, Characteristics of good brick, Field tests on Bricks	
		Week-2 (9-13 Sep.)	Classification of burnt clay bricks and their suitability, Manufacturing process of burnt clay brick, fly ash bricks, Aerated concrete blocks	CLASS TEST-I
		Week-3 (16-21 Sep.)	Flooring tiles – Types, uses, Manufacturing process of Cement - dry and wet (only flow chart), types of cement and its uses. Field tests on cement	
		Week-4 (23-28 Aug.)	Pre-cast concrete blocks- hollow, solid, pavement blocks, and their uses. Plywood, particle board Veneers, laminated board and their uses.	
3	OCTOBER	Week-1 (1-4, Oct.)	Types of glass: soda lime glass, lead glass and borosilicate glass and their uses. Ferrous and non-ferrous metals and their uses.	
		Week-2 (7-11, Oct.)	Special Construction Materials: Types of material and suitability in construction works of following materials: Water proofing, Termite proofing, Thermal and sound insulating materials	
		Week-3 (14-19, Oct.)	Fibers – Types – Jute, Glass, Plastic Asbestos Fibers, (only uses). Geo polymer cement: Geo-cement: properties, uses.	CLASS TEST-II
		Week-4 (21-26, Oct.)	Processed Construction Materials: Constituents and uses of POP (Plaster of Paris), POP finishing boards, sizes, and uses. Paints- whitewash, cement paint, Distempers	
		Week-5 (28-31, Oct.)	Oil Paints and Varnishes with their uses. (Situations where used)	
4	NOVEMBER	Week-1 (4-8, Nov.)	Industrial waste materials- Fly ash, Blast furnace slag, Granite and marble polishing waste and their uses	HOUSE TEST
		Week-2 (11-16, Nov.)		
		Week-3 (18-23, Nov.)	Agro waste materials - Rice husk, Bagasse, coir fibers and their uses.	
		Week-4 (25-31, Nov.)	Special processed construction materials, Geo-synthetic, Ferro Crete, Artificial timber, Artificial sand, and their uses.	
5	DECEMBER	Week-1 (2, Dec.)	Revision	

Signature of Teacher  
(Er. Munish Kumar)

Signature of H.O.D  
(Er. Chetan Mandela)

Monthly review of lesson plan by HOD:

Review for month of	Date of review	Comments by HOD	Remarks
August			
September			
October			
November			

## LESSON PLAN

Program Name	CIVIL ENGG.
Course/Subject Name	BASIC SURVEYING
Course/Subject Code	CEPC 203
Course/Subject Coordinator Name	AMANDEEP SINGH

### Evaluation scheme

S.No.	Subject Name	Study scheme (Hrs/Week)	Marks in evaluation scheme			
			Internal Assessment		External Assessment	
			Theory	Practical	Theory	Practical
I.	BASIC SURVEYING	TH [2+1(BS) ]	40	-	60	-
Reference books			<p>Punmia, B.C, Jain, Ashok Kumar; Jain, Arun Kumar, Surveying I, Laxmi Publications, New Delhi.</p> <p>Basak, N. N., Surveying and Levelling, McGraw Hill Education, New Delhi.</p> <p>Kanetkar, T. P.; Kulkarni, S. V., Surveying and Levelling volume I, Pune Vidyarthi Gruh Prakashan.</p> <p>Duggal, S. K., Survey I, McGraw Hill Education, New Delhi.</p> <p>Saikia, M D.; Das. B.M.; Das. M.M., Surveying, PHI Learning, New Delhi.</p> <p>Subramanian, R., Fundamentals of Surveying and Levelling, Oxford University Press. New Delhi.</p> <p>Rao, P. Venugopala Akella, Vijayalakshmi, Textbook of Surveying, PHI Learning New Delhi.</p> <p>Bhavikatti, S. S., Surveying and Levelling, Volume 1, I. K. International, New Delhi.</p> <p>Arora K R, Surveying Vol. I, Standard Book House.</p>			

Course Outcomes: After the completion of the course the student will be able to:

Select the type of survey required for given situation.

Compute area of open field using chain, tape and cross staff.

Conduct traversing in the field using chain and compass.

Use levelling instruments to determine reduced level for preparation of contour maps

Use digital planimeter to calculate the areas.



## Teaching Plan:

Sl. No.	Topic Covered	Proposed date	Actual Date	Remarks
1.	Survey- Purpose and Use, Types of surveying- Primary and Secondary	05-08-2024		
2.	Classification: Plane, Geodetic, Cadastral, Hydrographic, Photogrammetric and Aerial.	06-08-2024		
3.	<b>Brain Storming Session</b>	07-08-2024		
4.	Principles of Surveying.	12-08-2024		
5.	Scales: Engineer's scale, Representative Fraction (RF) and diagonal scale.	13-08-2024		
6.	<b>Brain Storming Session</b>	14-08-2024		
7.	Instruments used in chain survey: Metric Chain, Tapes, Arrow, ranging rod, Line ranger, Offset rod, Open cross staff, Optical square.	19-08-2024		
8.	Chain survey Station, Base line, Check line, Tie line, Offset, Tie station	20-08-2024		
9.	<b>Brain Storming Session</b>	21-08-2024		
10.	Ranging: Direct and Indirect Ranging.	27-08-2024		
11.	Methods of Chaining, obstacles in chaining.	28-08-2024		
12.	<b>Brain Storming Session</b>	02-09-2024		
13.	Errors in length: Instrumental error, personal error, error due to natural cause, random error.	03-09-2024		
14.	Principles of triangulation.	04-09-2024		
15.	<b>Brain Storming Session</b>	09-09-2024		
16.	Types of offsets: Perpendicular and Oblique.	10-09-2024		
17.	Conventional Signs, Recording of measurements in a field book.	11-09-2024		
18.	<b>Brain Storming Session</b>	16-09-2024		
19.	Compass Traversing- open, closed.	17-09-2024		
20.	Technical Terms: Geographic/ True Magnetic Meridians and Bearings	18-09-2024		
21.	<b>Brain Storming Session</b>	23-09-2024		
22.	Whole Circle Bearing system and Reduced Bearing system and examples on conversion of given bearing to another bearing (from one form to another)	24-09-2024		
23.	Fore Bearing and Back Bearing, Calculation of internal and external angles from bearings at a station.	25-09-2024		
24.	<b>Brain Storming Session</b>	30-09-2024		
25.	Dip of Magnetic needle, Magnetic Declination, Components of Prismatic Compass and their Functions	01-10-2024		
26.	Methods of using Prismatic Compass-Temporary adjustments and observing bearings.	07-10-2024		
27.	<b>Brain Storming Session</b>	08-10-2024		
28.	Local attraction, Methods of correction of observed bearings - Correction at station and correction to included angles.	09-10-2024		
29.	Basic terminologies: Level surfaces, Horizontal and vertical surfaces, Datum.	14-10-2024		



	<b>Brain Storming Session</b>	15-10-2024		
	Benchmarks- GTS, Permanent, Arbitrary and Temporary, Reduced Level, Rise, Fall, Line of collimation, Station, Back sight, Fore sight, Intermediate sight, Change point, Height of instruments.	16-10-2024		
32.	Types of levels: Dumpy, Tilting, Auto level, Digital level.	21-10-2024		
33.	<b>Brain Storming Session</b>	22-10-2024		
34.	Components of Dumpy Level and its fundamental axes, Temporary adjustments of Level.	23-10-2024		
35.	Types of Levelling Staff: Self-reading staff and Target staff. Reduction of level by Line of collimation	28-10-2024		
36.	<b>Brain Storming Session</b>	29-10-2024		
37.	Rise and Fall Method.	30-10-2024		
38.	Levelling Types: Simple, Differential, Fly, Profile and Reciprocal Levelling.	04-11-2024		
39.	<b>Brain Storming Session</b>	05-11-2024		
40.	Contour, contour intervals, horizontal equivalent. Uses of contour maps, Characteristics of contours	06-11-2024		
41.	Methods of Contouring: Direct and indirect	11-11-2024		
42.	<b>Brain Storming Session</b>	12-11-2024		
43.	Components and use of Digital planimeter.	13-11-2024		
44.	Measurement of area using digital planimeter.	18-11-2024		
45.	<b>Brain Storming Session</b>	19-11-2024		
46.	Measurement of volume of reservoir from contour map.	20-11-2024		
47.	Revision Class	25-11-2024		
48.	<b>Brain Storming Session</b>	26-11-2024		
49.	Revision Class	27-11-2024		
50.	Revision Class	02-12-2024		

### Assignments:

Assignment serial	Contents of syllabus covered	Proposed date	Actual date	Remarks
A-1	Overview & Classification of Survey, Chain Surveying	28-08-2024		
A-2	Compass Traverse Survey, Levelling & Contouring	30-09-2024		

### House Test/Class Test:

House/Class Test	Contents of syllabus covered	Proposed date	Actual date	Remarks
CT-I	30% of the syllabus	As per Academic Calender		
CT-II	Next 30% of the syllabus	As per Academic Calender		
House Test	80% of the syllabus	As per Academic Calender		

(Signature of Teacher)

(Signature of HOD)

DEPARTMENT OF CIVIL ENGINEERING  
Dr.B.R.AMBEDKAR GOVT. POLYTECHNIC AMBOTA , UNA (H.P)  
LESSON PLAN FOR MECHANICS OF MATERIALS (SEMESTER-3rd) SESSION: (Aug. - Dec.,2024)

S.	MONTH	WEEK	CONTENTS	REMARKS
1	AUGUST	Week-1 (1-3 Aug.)	Moment of Inertia Moment of inertia (M.I.): Definition, M.I. of plane lamina, Radius of gyration, section modulus, Parallel and Perpendicular axes theorems (without derivations).	
		Week-2 (5-9 Aug.)	M.I. of rectangle, square, circle, semi-circle, quarter circle and triangle section (without derivations). M.I. of symmetrical and unsymmetrical I-section.	
		Week-3 (12-17 Aug.)	Channel section, T-section, Angle section, Hollow sections about centroidal axes. Polar Moment of Inertia of solid circular sections.	
		Week-4 (19-24 Aug.)	Simple Stresses and Strains Definition of rigid, elastic and plastic bodies, Definition of stress, strain, elasticity, Hook's law, Elastic limit, Modulus of elasticity, Type of Stresses-Normal, Direct, Bending and Shear and nature of stresses i.e., Tensile and Compressive stresses.	
		Week-5 (26-31 Aug.)	Standard stress strain curve for steel bar under tension, Yield stress, Proof stress, Ultimate stress, Strain at various critical points, Percentage elongation and Factor of safety, Deformation of body due to axial force.	
2	SEPTEMBER	Week-1 (1-7 Sep.)	Forces applied at intermediate sections, Maximum and minimum stress induced, Composite section under axial loading, Concept of temperature stresses and strain, Stress and strain developed due to temperature variation in homogeneous simple bar (no composite section).	
		Week-2 (9-13 Sep.)	Longitudinal and lateral strain, Modulus of Rigidity, Poisson's ratio, volumetric strain, change in volume, Bulk modulus (Introduction only), Relation between modulus of elasticity, modulus of rigidity and bulk modulus (without derivation).	CLASS TEST-I
		Week-3 (16-21 Sep.)	Shear Force and Bending Moment Types of supports, beams, and loads, Concept and definition of shear force and bending moment, Relation between load, shear force and bending moment (without derivation).	
		Week-4 (23-28 Sep.)	Shear force and bending moment diagram for cantilever and simply supported beams subjected to point loads.	
3	OCTOBER	Week-1 (1-4, Oct.)	uniformly distributed loads (combination of any two types of loading), point of contra flexure.	
		Week-2 (7-11, Oct.)	Bending and Shear Stresses in beams, Concept and theory of pure bending, assumptions, flexural equation (without derivation), bending stresses and their nature, bending stress distribution diagram.	
		Week-3 (14-19, Oct.)	Concept of moment of resistance and simple numerical problems using flexural equation, Shear stress equation (without derivation), relation between maximum and average shear stress for rectangular.	CLASS TEST-II
		Week-4 (21-26, Oct.)	rectangular and circular section, shear stress distribution diagram, Shear stress distribution for square, rectangular, circle, hollow, angle sections, channel section, I-section, T section.	
		Week-5 (28-31, Oct.)	Simple numerical problems based on shear equation.	
4	NOVEMBER	Week-1(4-8, Nov.)	Columns Concept of compression member, short and long column, Effective length, Radius of gyration, Slenderness ratio.	
		Week-2(11-16, Nov.)	Types of end condition for columns, Buckling of axially loaded columns.	HOUSE TEST
		Week-3 (18-23, Nov.)	Euler's theory, assumptions made in Euler's theory and its limitations, Application of Euler's equation to calculate buckling load.	
		Week-4 (25-31, Nov.)	Rankine's formula and its application to calculate crippling load, Concept of working load/safe load, design load and factor of safety.	
5	DECEMBER	Week-1(2, Dec.)	Revision	

Signature of Teacher  
(Er. Harish Singh)

Signature of H.O.D.  
(Er. Chetan Mandala)

Monthly review of lesson plan by HOD:

Review for month of	Date of review	Comments by HOD	Remarks
August			
September			
October			
November			



**DEPARTMENT OF CIVIL ENGINEERING**  
**Dr.B.R.AMBEDKAR GOVT. POLYTECHNIC AMBOTA, UNA (H.P)**  
**LESSON PLAN FOR BUILDING CONSTRUCTION (SEMESTER-3rd) SESSION: (Aug. - Dec.,2024)**

MONTH	WEEK	CONTENTS	REMARKS
AUGUST	Week-1 (1-3 Aug.)	<b>Overview of Building Components:</b> Classification of Buildings as per National Building Code Group A to I, as per Types of Construction Load Bearing Structure, Framed Structure, Composite Structure.	
	Week-2 (5-9 Aug.)	Building Components - Functions of Building Components, Substructure - Foundation, Plinth, Superstructure - Walls, Partition wall, Cavity wall, Sill, Lintel, Doors and Windows, Floor, Roof, Columns, Beams, Parapet.	
	Week-3 (12-17 Aug.)	<b>Construction of Substructure:</b> Job Layout, Site Clearance, Layout for load bearing Structure and Framed Structure by Center Line and Face Line Method. Precautions.	
	Week-4 (19-24 Aug.)	Earthwork: Excavation for Foundation, Timbering and Shuttling, Earthwork for embankment, Material for plinth filling, Tools and plants used for earthwork.	
	Week-5 (26-31 Aug.)	Foundation: Functions of foundation, Types of foundation - Shallow Foundation, Stepped Footing, Wall Footing, Column Footing, Isolated.	
2 SEPTEMBER	Week-1 (1-7 Sep.)	Combined Column Footing, Raft Foundation, Grillage Foundation, Deep Foundation - Pile Foundation, Well foundation.	CLASS TEST-I
	Week-2 (9-13 Sep.)	<b>Construction of Superstructure:</b> Stone Masonry: Terms used in stone masonry- facing, backing, hearting, through stone, corner stone, cornice.	
	Week-3 (16-21 Sep.)	Types of stone masonry: Rubble masonry, Ashlar Masonry, and their types, Joints in stone masonry and their purpose, Selection of Stone Masonry, Precautions to be taken in Stone Masonry Construction.	
	Week-4 (23-28 Aug.)	Brick masonry: Terms used in brick masonry- header, stretcher, closer, quoin, course, face, back, hearting, bat bond, joints, lap, frog line, level and plumb, Bonds in brick masonry- header bond, stretcher bond, English bond and Flemish bond, Requirements of good brick masonry.	
3 OCTOBER	Week-1 (1-4, Oct.)	Junctions in brick masonry and their purpose and procedure. Precautions to be observed in Brick Masonry Construction. Comparison between stone and Brick Masonry.	
	Week-2 (7-11, Oct.)	Tools and plants required for construction of stone and brick masonry. Hollow concrete block masonry and composite masonry Scaffolding and Shoring: Purpose, Types of Scaffolding, Process of Erection and Dismantling, Purpose and Types of Shoring, Underpinning.	
	Week-3 (14-19, Oct.)	Formwork: Definition of Formwork, Requirements of Formwork, Materials used in Formwork, Types of Formworks, Removal of formwork, Building Communication and Ventilation: Horizontal Communication: Doors - Horizontal Communication: Doors - Components of Doors, Full Panelled Doors, Partly Panelled and Glazed Doors, Flush Doors, Collapsible Doors, Rolling Shutters, Revolving Doors, Glazed Doors: Sizes of Door recommended by BIS.	CLASS TEST-II
	Week-4 (21-26, Oct.)	Windows: Component of windows, Types of Windows - Full Panelled, Partly Panelled and Glazed, wooden, Steel, Aluminium windows, Sliding Windows, Louvered Window, Bay window, Corner window, clear-storey window, Gable and Dormer window, Skylight. Sizes of Windows recommended by BIS, Ventilators.	
	Week-5 (28-31, Oct.)	Vertical Communication: Means of Vertical Communication- Stair Case, Terms used in staircase-steps, tread, riser, nosing, soffit, waist slab, baluster, balustrade, scotia, handrails, newel post, landing, headroom, winder, Types of staircases (On the basis of shape): Straight, dog-legged, open well, Spiral, quarter turn, bifurcated, three quarter turn and Half turn. (On the basis of Material): Stone, Brick, R.C.C., wooden and Metal.	
4 NOVEMBER	Week-1 (4-8, Nov.)	<b>Building Finishes:</b> Floors and Roofs: Types of Floor Finishes and its suitability- Kota, Marble, Granite, Ceramic Tiles, Vitrified, Concrete Floors, wooden Flooring, Skirting and Dado. Process of Laying and Construction, Finishing and Polishing of Floors.	HOUSE TEST
	Week-2 (11-16, Nov.)	Roofing Materials- RCC, Mangalore Tiles, AC Sheets, G.I. Sheets, Corrugated G.I. Sheets, Plastic and Fibre Sheets.	
	Week-3 (18-23, Nov.)	Types of Roofs: Flat roof, Pitched Roof-King Post truss, Queen Post Truss, Terms used in roofs, Wall Finishes: Plastering - Necessity of Plastering, Procedure of Plastering, Single Coat Plaster, Double Coat Plaster, Rough finish, Neeru Finishing and Plaster of Paris (POP).	
	Week-4 (25-31, Nov.)	Special Plasters- Strucco plaster, sponge finish, pebble finish, Plaster, Precautions to be taken in plastering, defects in plastering, Pointing - Necessity, Types of pointing and procedure of Pointing. Painting - Necessity, Surface Preparation for painting, Methods of Application.	
5 DECEMBER	Week-1 (2, Dec.)	Revision	

Signature of Teacher  
(Er. Manish Kumar)

Signature of HOD  
(Er. Chetan Mandali)

Monthly review of lesson plan by HOD:		Comments by HOD	Remarks
Review for month of	Date of review		
August			
September			
October			
November			



**DEPARTMENT OF CIVIL ENGINEERING**  
**Dr.B.R.AMBEDKAR GOVT. POLYTECHNIC AMBOTA , UNA (H.P)**  
**LESSON PLAN FOR CONCRETE TECHNOLOGY (SEMESTER-3rd) SESSION: (Aug. - Dec.,2024)**

	WEEK	CONTENTS	REMARKS
1	Week-1 (1-3 Aug.)	<b>Cement, Aggregates and Water :</b> Physical properties of OPC and PPC- fineness, standard consistency, setting time, soundness, compressive strength. Different grades of OPC and relevant BIS codes	
	Week-2 (5-9 Aug.)	Storage of cement and effect of storage on properties of cement. BIS Specifications and field applications of different types of cements: Rapid hardening, Low heat, Portland pozzolana, Sulphate resisting, Blast furnace slag, High Alumina and White cement	
	Week-3 (12-17 Aug.)	<b>Aggregates:</b> Requirements of good aggregate. Classification according to size and shape. Fine aggregates: Properties, size, specific gravity, bulk density, water absorption and bulking, fineness modulus and grading zone of sand, silt content and their specification as per IS 383. Concept of crushed Sand	
	Week-4 (19-24 Aug.)	Coarse aggregates: Properties, size, shape, surface texture, water absorption, soundness, specific gravity and bulk density, fineness modulus of coarse aggregate, grading of coarse aggregates	
	Week-5 (26-31 Aug.)	crushing value, impact value and abrasion value of coarse aggregates with specifications. Water: Quality of water, impurities in mixing water and permissible limits for solids as per IS 456	
2	Week-1 (1-7 Sep.)	<b>Concrete Mix Design and Testing of Concrete:</b> Concrete: Different grades of concrete, provisions of IS 456. Duff Abraham water cement (w/c) ratio law, significance of w/c ratio, selection of w/c ratio for different grades, maximum w/c ratio for different grades of concrete for different exposure conditions as per IS 456	
	Week-2 (9-13 Sep.)	Properties of fresh concrete. Workability: Factors affecting workability of concrete. Determination of workability of concrete by slump cone, compaction factor, Vee-Bee Consistometer.	CLASS TEST-I
	Week-3 (16-21 Sep.)	Value of workability requirement for different types of concrete works. Segregation, bleeding, and preventive measures. Properties of Hardened concrete. Strength, Durability, Impermeability	
	Week-4 (23-28 Sep.)	Concrete mix design: Objectives, methods of mix design, study of mix design as per IS 10262 (only procedural steps). Testing of concrete, determination of compressive strength of concrete cubes at different ages, interpretation, and co-relation of test results.	
3	Week-1 (1-4 Oct.)	Non- destructive testing of concrete. Rebound hammer test, working principle of rebound hammer and 15 factor affecting the rebound index, Ultrasonic pulse velocity test as per IS 13311 (part 1 and 2). Importance of NDT tests	
	Week-2 (7-11 Oct.)	<b>Quality Control of Concrete:</b> Concreting Operations: Batching, Mixing, Transportation, Placing, Compaction, Curing and Finishing of concrete	
	Week-3 (14-19 Oct.)	Forms for concreting: Different types of form works for beams, slabs, columns, materials used for form work, requirement of good form work. Stripping time for removal of form works per IS 456	CLASS TEST-II
	Week-4 (21-26 Oct.)	Waterproofing: Importance and need of waterproofing, methods of waterproofing and materials used for waterproofing. Joints in concrete construction: Types of joints.	
	Week-5 (28-31 Oct.)	Methods for joining old and new concrete, materials used for filling joints: Chemical Admixture, Special Concrete and Extreme Weather concreting. Admixtures in concrete. Purpose, properties	
4	Week-1(4-8 Nov.)	Application for different types of admixtures such as accelerating admixtures, retarding admixtures, water reducing admixtures, air entraining admixtures and super plasticizers.	
	Week-2(11-15 Nov.)	Special Concrete. Properties, advantages.	HOUSE TEST
	Week-3 (18-23 Nov.)	Limitation of following types of Special concrete: Ready mix Concrete, Fibre Reinforced Concrete, High performance Concrete, Self-compacting concrete and light weight concrete.	
	Week-4 (25-31 Nov.)	Special Concrete. Properties, advantages and limitation of following types of Special concrete: Ready mix Concrete, Fibre Reinforced Concrete, High performance Concrete, Self-compacting concrete and light weight concrete	
5	Week-1(2 Dec.)	Revision	

Signature of Teacher  
(Er. Manoj Kumar)

Signature of H.O.D  
(Er. Chetan Mandela)

Monthly review of lesson plan by HOD:

Review for month of	Date of review	Comments by HOD	Remarks
August			
September			
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## LESSON PLAN

Program Name	CIVIL ENGG.
Course/Subject Name	GEOTECHNICAL ENGINEERING
Course/Subject Code	CEPC 211
Course/Subject Coordinator Name	AMANDEEP SINGH

### Evaluation scheme

S.No.	Subject Name	Study scheme (Hrs/Week)	Marks in evaluation scheme			
			Internal Assessment		External Assessment	
			Theory	Practical	Theory	Practical
1.	GEOTECHNICAL ENGINEERING	TH [3+1(BS) ]	40	-	60	-
Reference books			<p>Punmia, B.C, Jain, Ashok Kumar; Jain, Arun Kumar, Surveying I, Laxmi Publications, New Delhi.</p> <p>Basak, N. N., Surveying and Levelling, McGraw Hill Education, New Delhi.</p> <p>Kanetkar, T. P.; Kulkarni, S. V., Surveying and Levelling volume I, Pune Vidyarthi Gruh Prakashan.</p> <p>Duggal, S. K., Survey I, McGraw Hill Education, New Delhi.</p> <p>Saikia, M D.; Das. B.M.; Das. M.M., Surveying, PHI Learning, New Delhi.</p> <p>Subramanian, R., Fundamentals of Surveying and Levelling, Oxford University Press, New Delhi.</p> <p>Rao, P. Venugopala Akella, Vijayalakshmi, Textbook of Surveying, PHI Learning New Delhi.</p> <p>Bhavikatti, S. S., Surveying and Levelling, Volume 1, I. K. International, New Delhi.</p> <p>Arora K R, Surveying Vol. I, Standard Book House.</p>			

Course Outcomes: After the completion of the course the student will be able to:

- Select the type of survey required for given situation.
- Compute area of open field using chain, tape and cross staff.
- Conduct traversing in the field using chain and compass.
- Use levelling instruments to determine reduced level for preparation of contour maps
- Use digital planimeter to calculate the areas.



## Teaching Plan:

Sl. No.	Topic Covered	Proposed date	Actual Date	Remarks
1.	Introduction of Geology, Branches of Geology, Importance of Geology for civil engineering structure and composition of earth	02-08-2024		
2.	Definition of a rock: Classification based on their genesis (mode of origin), formation,	03-08-2024		
3.	Classification, and engineering uses of igneous, sedimentary, and metamorphic rocks.	05-08-2024		
4.	<b>Brain Storming Session</b>	06-08-2024		
5.	Importance of soil as construction material in Civil engineering structures and as foundation bed for structures.	09-08-2024		
6.	Field application of geotechnical engineering for foundation design, pavement design,	12-08-2024		
7.	design of earth retaining structures, design of earthen dam	13-08-2024		
8.	<b>Brain Storming Session</b>	16-08-2024		
9.	Soil as a three-phase system, water content, determination of water content by oven drying method as per BIS code	17-08-2024		
10.	void ratio, porosity and degree of saturation, density index.	19-08-2024		
11.	Unit weight of soil mass – bulk unit weight, dry unit weight, unit weight of solids, saturated unit weight, submerged unit weight	20-08-2024		
12.	<b>Brain Storming Session</b>	23-08-2024		
13.	Determination of bulk unit weight and dry unit weight by core cutter and sand replacement method,	24-08-2024		
14.	Consistency of soil, Atterberg limits of consistency: Liquid limit, plastic limit and shrinkage limit. Plasticity index.	27-08-2024		
15.	Particle size distribution test and plotting of curve,	30-08-2024		
16.	<b>Brain Storming Session</b>	31-08-2024		
17.	Determination of effective diameter of soil, well graded and uniformly graded soils	02-09-2024		
18.	BIS classification of soil.	03-09-2024		
19.	Definition of permeability, Darcy's law of permeability, coefficient of permeability	06-09-2024		
20.	<b>Brain Storming Session</b>	07-09-2024		
21.	factors affecting permeability,	09-09-2024		
22.	determination of coefficient of permeability by constant head and falling head tests,	10-09-2024		
23.	simple problems to determine coefficient of permeability	13-09-2024		
24.	<b>Brain Storming Session</b>	16-09-2024		
25.	Seepage through earthen structures, seepage velocity, seepage pressure	17-09-2024		
26.	phreatic line, flow lines, application of flow net, (No numerical problems).	20-09-2024		
27.	Shear failure of soil, concept of shear strength of soil	21-09-2024		
28.	<b>Brain Storming Session</b>	23-09-2024		
29.	Components of shearing resistance of soil – cohesion, internal friction	24-09-2024		



	Monr-Coulomb failure theory, Strength envelope, strength equation for purely cohesive and cohesion less soils	27-09-2024	
	Direct shear	28-09-2024	
2.	<b>Brain Storming Session</b>	30-09-2024	
33.	vane shear test – laboratory methods.	01-10-2024	
34.	Bearing capacity and theory of earth pressure	04-10-2024	
35.	Concept of bearing capacity, ultimate bearing capacity, safe bearing capacity and allowable bearing pressure	05-10-2024	
36.	<b>Brain Storming Session</b>	07-10-2024	
37.	Introduction to Terzaghi's analysis and assumptions, effect of water table on bearing capacity.	08-10-2024	
38.	Field methods for determination of bearing capacity – Plate load	11-10-2024	
39.	Standard Penetration Test. Test procedures as per IS:1888 & IS:2131.	14-10-2024	
40.	<b>Brain Storming Session</b>	15-10-2024	
41.	Concept of compaction, Standard and Modified proctor test as per IS code.	18-10-2024	
42.	Plotting of Compaction curve for determining:	19-10-2024	
43.	Optimum moisture content (OMC), maximum dry density (MDD), Zero air voids line	21-10-2024	
44.	<b>Brain Storming Session</b>	22-10-2024	
45.	Factors affecting compaction.	25-10-2024	
46.	field methods of compaction – rolling, ramming and vibration.	26-10-2024	
47.	Suitability of various compaction equipment -smooth wheel roller, sheep foot roller, pneumatic tyre roller, Rammer and Vibrator	28-10-2024	
48.	Difference between compaction and consolidation	29-10-2024	
49.	<b>Brain Storming Session</b>	01-11-2024	
50.	Concept of soil stabilization	04-11-2024	
51.	necessity of soil stabilization, different methods of soil stabilization	05-11-2024	
52.	California bearing ratio (CBR) test - Meaning and Utilization in Pavement Construction	08-11-2024	
53.	<b>Brain Storming Session</b>	11-11-2024	
54.	Necessity of site investigation and soil exploration:	12-11-2024	
55.	Types of exploration, criteria for deciding the location and number of test pits and bores.	16-11-2024	
56.	Field identification of soil – dry strength test, dilatancy test and toughness test.	18-11-2024	
57.	<b>Brain Storming Session</b>	19-11-2024	
58.	Revision Class	22-11-2024	
59.	Revision Class	23-11-2024	
60.	Revision Class	25-11-2024	
61.	Revision Class	26-11-2024	
62.	Revision Class	29-11-2024	
63.	Revision Class	02-12-2024	



Assignments:

Assignment serial	Contents of syllabus covered	Proposed date	Actual date	Remarks
	Overview of Geology and Geotechnical Engineering, Physical and Index Properties of Soil	30-08-2024		
A-2	Permeability and Shear Strength of Soil, Bearing Capacity of Soil	30-09-2024		

House Test/Class Test:

House/Class Test	Contents of syllabus covered	Proposed date	Actual date	Remarks
CT-I	30% of the syllabus	As per Academic Calender		
CT-II	Next 30% of the syllabus	As per Academic Calender		
House Test	80% of the syllabus	As per Academic Calender		

  
(Signature of Teacher)

  
(Signature of HOD)

DEPARTMENT OF CIVIL ENGINEERING  
Dr.B.R.AMBEDKAR GOVT. POLYTECHNIC AMBOTA , UNA (H.P)  
LESSON PLAN FOR CONSTRUCTION MATERIALS LAB GROUP-I (SEMESTER-3rd) SESSION: (Aug. - Dec.,2024)

MONTH	WEEK	CONTENTS	REMARKS
1	AUGUST	Week-1 (1-3 Aug.)	Identify various sizes of available coarse aggregates from sample of 10 kg in laboratory and prepare report (60,40, 20,10 mm)
		Week-2 (5-9 Aug.)	2nd Saturday
		Week-3 (12-17 Aug.)	Identify the available construction materials in the laboratory based on their sources. Checking of files & viva
		Week-4 (19-24 Aug.)	Identify the grain distribution pattern in given sample of teak wood in the laboratory and draw the various patterns. (Along and perpendicular to the grains) Checking of files & viva
		Week-5 (26-31 Aug.)	Prepare the lime putty by mixing lime (1 kg) with water in appropriate proportion and prepare report on slaking of lime. Checking of files & viva
2	SEPTEMBER	Week-1 (1-7 Sep.)	Identify various layers and types of soil in foundation pit by visiting at least 3 construction sites in different locations of city and prepare report consisting of photographs and samples. Part I. Checking of files & viva
		Week-2 (9-13 Sep.)	2nd Saturday
		Week-3 (16-21 Sep.)	Identify various layers and types of soil in foundation pit by visiting at least 3 construction sites in different locations of city and prepare report consisting of photographs and samples. Part II. Checking of files & viva
		Week-4 (23-28 Aug.)	Select first class, second class and third-class bricks from the stake of bricks and prepare report on the basis of its properties. Checking of files & viva
3	OCTOBER	Week-1 (1-4, Oct.)	Measure dimensions of 10 bricks and find average dimension and weight. Perform field tests: dropping, striking, and scratching by nail and correlate the results obtained. Checking of files & viva
		Week-2 (7-11, Oct.)	2nd Saturday
		Week-3 (14-19, Oct.)	Identify different types of flooring tiles such as vitrified tiles, ceramic tiles, glazed tiles, mosaic tiles, antiskid tiles, checkered tiles, paving blocks and prepare report about the specifications. Checking of files & viva
		Week-4 (21-26, Oct.)	Apply the relevant termite chemical on given damaged sample of timber. Identify the type of glasses from the given samples. Checking of files & viva
		Week-5 (28-31, Oct.)	Apply two or more coats of selected paint on the prepared base of a given wall surface for the area of 1m x 1m using suitable brush/rollers adopting safe practices. Part I. Checking of files & viva
4	NOVEMBER	Week-1(4-8, Nov.)	Apply two or more coats of selected paint on the prepared base of a given wall surface for the area of 1m x 1m using suitable brush/rollers adopting safe practices. Part II. Checking of files & viva
		Week-2(11-16,Nov.)	
		Week-3 (18-23, Nov.)	Prepare the cement mortar of proportion 1:3 or 1:6 using artificial sand as a special processed construction material. Prepare mortar using cement and Fly ash or Granite/marble polishing waste in the proportion 1:6 or
		Week-4 (25-31,Nov.)	Checking of files & viva

Signature of Teacher  
(Er. Munish Kumar)

Signature of H.O.D  
(Er. Chetan Mandela)

Review for month of	Date of review	Comments by HOD	Remarks
August			
September			
October			
November			



DEPARTMENT OF CIVIL ENGINEERING  
Dr.B.R.AMBEDKAR GOVT. POLYTECHNIC AMBOTA , UNA (H.P)  
LESSON PLAN FOR CONSTRUCTION MATERIALS LAB GROUP-II (SEMESTER-3rd) SESSION: (Aug. - Dec.,2024)

MONTH	WEEK	CONTENTS	REMARKS
1	AUGUST	Week-2 (5-9 Aug.) Identify various sizes of available coarse aggregates from sample of 10 kg in laboratory and prepare report (60,40, 20,10 mm)	
		Week-3 (12-17 Aug.) Identify the available construction materials in the laboratory based on their sources	
		Week-4 (19-24 Aug.) Identify the grain distribution pattern in given sample of teak wood in the laboratory and draw the various patterns. (Along and perpendicular to the grains)	
		Week-5 (26-31 Aug.) Prepare the lime putty by mixing lime (1 kg) with water in appropriate proportion and pre-pare report on siaking of lime.	
2	SEPTEMBER	Week-1 (1-7 Sep.) Identify various layers and types of soil in foundation pit by visiting at least 3 construction sites in different locations of city and prepare report consisting of photographs and samples. Part I	
		Week-2 (9-13 Sep.) Identify various layers and types of soil in foundation pit by visiting at least 3 construction sites in different locations of city and prepare report consisting of photographs and samples. Part II	CLASS T
		Week-3 (16-21 Sep.) Select first class, second class and third-class bricks from the stake of bricks and prepare report on the basis of its properties.	
		Week-4 (23-28 Aug.) Measure dimensions of 10 bricks and find average dimension and weight. Perform field tests- dropping, striking, and scratching by nail and correlate the results obtained.	
3	OCTOBER	Week-1 (1-4, Oct.) Identify different types of flooring tiles such as vitrified tiles, ceramic tiles, glazed tiles, mosaic tiles, antiskid tiles, checkered tiles, paving blocks and prepare report about the specifications.	
		Week-2 (7-11, Oct.) Apply the relevant termite chemical on given damaged sample of timber.	
		Week-3 (14-19, Oct.) Identify the type of glasses from the given samples.	CLASS T
		Week-4 (21-26, Oct.) Apply two or more coats of selected paint on the prepared base of a given wall surface for the area of 1m x 1m using suitable brush/rollers adopting safe practices. Part I	
		Week-5 (28-31, Oct.) Apply two or more coats of selected paint on the prepared base of a given wall surface for the area of 1m x 1m using suitable brush/rollers adopting safe practices. Part II	
4	NOVEMBER	Week-1(4-8, Nov.) Prepare the cement mortar of proportion 1:3 or 1:6 using artificial sand as a special processed construction material.	
		Week-2(11-16,Nov.)	HOUSE
		Week-3 (18-23, Nov.) Prepare mortar using cement and Fly ash or Granite/marble polishing waste in the proportion 1:5 or 1:3.	
		Week-4 (25-31,Nov.) Checking of files & viva	

Signature of Teacher  
(Er. Munish Kumar)

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(Er. Chetan Ma)

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DEPARTMENT OF CIVIL ENGINEERING  
Dr.B.R.AMBEDKAR GOVT. POLYTECHNIC AMBOTA , UNA (H.P)  
LESSON PLAN FOR MECHANICS OF MATERIALS LAB GROUP-I (SEMESTER-3rd) SESSION: (Aug. - Dec.,2024)

Sr. No.	MONTH	WEEK	CONTENTS	REMARKS
1	AUGUST	Week-1 (1-3 Aug.)	INTRODUCTION	
		Week-2 (5-9 Aug.)	Study and understand the use and components of Universal Testing Machine (UTM)	
		Week-3 (12-17 Aug.)	Perform Tension test on mild steel as per IS:432(1)	
		Week-4 (19-24 Aug.)	Perform tension test on Tor steel as per IS:1608, IS:1139	
		Week-5 (26-31 Aug.)	Determine Water Absorption on bricks per IS:3495 (part II), IS:1077 or tile IS:1237	
2	SEPTEMBER	Week-1 (1-7 Sep.)	Determine Compressive strength of dry and wet bricks as per IS:3495(part I), IS:1077	
		Week-2 (9-13 Sep.)	Checking of files & viva	CLASS TE
		Week-3 (16-21 Sep.)	Conduct Abrasion Test on flooring tiles (anyone) e.g., Mosaic tiles, Ceramic Tiles as per IS: 13630 (part7), Cement Tile as per IS: 1237.	
		Week-4 (23-28 Aug.)	Checking of files & viva	
3	OCTOBER	Week-1 (1-4, Oct.)	Perform Single Shear and double shear test on any two metals e.g., Mild steel/ brass/aluminium/copper / cast iron etc as per IS:5242	
		Week-2 (7-11, Oct.)	Checking of files & viva	
		Week-3 (14-19, Oct.)	Plot Shear force and Bending Moment diagrams for simply supported beams.	CLASS TE
		Week-4 (21-26, Oct.)	Checking of files & viva	
		Week-5 (28-31, Oct.)	Conduct Flexural test on timber beam on rectangular section in both orientations as per IS:1708, IS:2408.	
4	NOVEMBER	Week-1(4-8, Nov.)	Conduct Flexure test on floor tiles IS:1237, IS:13630 or roofing tiles as per IS:654, IS:2690	
		Week-2(11-16,Nov.)		HOUSE TE
		Week-3 (18-23, Nov.)	Checking of files & viva	
		Week-4 (25-31,Nov.)	Checking of files & viva	

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Review for month of	Date of review	Comments by HOD	Remarks
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DEPARTMENT OF CIVIL ENGINEERING  
Dr.B.R.AMBEDKAR GOVT. POLYTECHNIC AMBOTA , UNA (H.P)  
LESSON PLAN FOR MECHANICS OF MATERIALS LAB GROUP-II (SEMESTER-3rd) SESSION: (Aug. - Dec.,2024)

Sr. No.	MONTH	WEEK	CONTENTS	REMARKS
1	AUGUST	Week-1 (1-3 Aug.)	INTRODUCTION	
		Week-2 (5-9 Aug.)	Study and understand the use and components of Universal Testing Machine (UTM)	
		Week-3 (12-17 Aug.)	Perform Tension test on mild steel as per IS:432(1)	
		Week-4 (19-24 Aug.)	Perform tension test on Tor steel as per IS:1608, IS:1139	
		Week-5 (26-31 Aug.)	Determine Water Absorption on bricks per IS:3495 (part II), IS:1077 or tile IS:1237	
2	SEPTEMBER	Week-1 (1-7 Sep.)	Determine Compressive strength of dry and wet bricks as per IS:3495(part I), IS:1077	
		Week-2 (9-13 Sep.)	Checking of files & viva	CLASS TEST
		Week-3 (16-21 Sep.)	Conduct Abrasion Test on flooring tiles (anyone) e.g., Mosaic tiles, Ceramic Tiles as per IS:13630 (part7), Cement Tile as per IS:1237	
		Week-4 (23-28 Aug.)	Checking of files & viva	
3	OCTOBER	Week-1 (1-4, Oct.)	Perform Single Shear and double shear test on any two metals e.g., Mild steel/ brass/aluminium/copper / cast iron etc as per IS:5242	
		Week-2 (7-11, Oct.)	Checking of files & viva	
		Week-3 (14-19, Oct.)	Plot Shear force and Bending Moment diagrams for simply supported beams.	CLASS TEST
		Week-4 (21-26, Oct.)	Checking of files & viva	
		Week-5 (28-31, Oct.)	Conduct Flexural test on timber beam on rectangular section in both orientations as per IS:1708, IS:2408	
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		Week-3 (18-23, Nov.)	Checking of files & viva	
		Week-4 (25-31,Nov.)	Checking of files & viva	

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DEPARTMENT OF CIVIL ENGINEERING  
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LESSON PLAN FOR CONCRETE TECHNOLOGY LAB GROUP-I (SEMESTER-3rd) SESSION: (Aug. - Dec., 2024)

Sr. No.	MONTH	WEEK	CONTENTS	REMARKS
1	AUGUST	Week-2 (5-9 Aug.)	Determine fineness of cement by Blaine's air permeability apparatus or by sieving	
		Week-3 (12-17 Aug.)	Determine specific gravity, standard consistency, initial and final setting times of cement. Checking of files & viva	
		Week-4 (19-24 Aug.)	Checking of files & viva	
		Week-5 (26-31 Aug.)	Determine compressive strength of cement. Checking of files & viva	
2	SEPTEMBER	Week-1 (1-7 Sep.)	Determine silt content in sand. Checking of files & viva	
		Week-2 (9-13 Sep.)	Determine bulking of sand. Checking of files & viva	CLASS TEST-I
		Week-3 (16-21 Sep.)	Determine bulk density of fine and coarse aggregates. Checking of files & viva	
		Week-4 (23-28 Aug.)	Determine water absorption of fine and coarse aggregates. Checking of files & viva	
3	OCTOBER	Week-1 (1-4, Oct.)	Determine Fineness modulus of fine aggregate by sieve analysis. Checking of files & viva	
		Week-2 (7-11, Oct.)	Determine elongation and flakiness index of coarse aggregates. Checking of files & viva	
		Week-3 (14-19, Oct.)	Determine workability of concrete by slump cone test. Checking of files & viva	CLASS TEST-II
		Week-4 (21-26, Oct.)	Determine workability of concrete by compaction factor test. Checking of files & viva	
		Week-5 (28-31, Oct.)	Checking of files & viva	
4	NOVEMBER	Week-1 (4-8, Nov.)	To prepare concrete mix of a particular grade and determine compressive strength of concrete for 7 and 28 days. Checking of files & viva	
		Week-2 (11-16, Nov.)		HOUSE TEST
		Week-3 (18-23, Nov.)	Demonstration of NDT equipment. Checking of files & viva	
		Week-4 (25-31, Nov.)	Checking of files & viva	

Signature of Teacher  
(Er. Manoj Kumar)

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(Er. Chetan Mandala)

Review for month of	Date of review	Comments by HOD	Remarks
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LESSON PLAN FOR CONCRETE TECHNOLOGY LAB GROUP-II (SEMESTER-3rd) SESSION: (Aug. - Dec.,2024)

Sr. No.	MONTH	WEEK	CONTENTS	REMARK
1	AUGUST	Week-2 (5-9 Aug.)	Determine fineness of cement by Blaine's air permeability apparatus or by sieving.	
		Week-3 (12-17 Aug.)	Determine specific gravity, standard consistency, initial and final setting times of cement, Checking of files & viva	
		Week-4 (19-24 Aug.)	Checking of files & viva	
		Week-5 (26-31 Aug.)	Determine compressive strength of cement, Checking of files & viva	
2	SEPTEMBER	Week-1 (1-7 Sep.)	Determine silt content in sand. Checking of files & viva	
		Week-2 (9-13 Sep.)	Determine bulking of sand. Checking of files & viva	CLASS TEST
		Week-3 (16-21 Sep.)	Determine bulk density of fine and coarse aggregates. Checking of files & viva	
		Week-4 (23-28 Aug.)	Determine water absorption of fine and coarse aggregates. Checking of files & viva	
3	OCTOBER	Week-1 (1-4 Oct.)	Determine Fineness modulus of fine aggregate by sieve analysis. Checking of files & viva	
		Week-2 (7-11 Oct.)	Determine elongation and flakiness index of coarse aggregates. Checking of files & viva	
		Week-3 (14-19 Oct.)	Determine workability of concrete by slump cone test. Checking of files & viva	CLASS TEST
		Week-4 (21-26 Oct.)	Determine workability of concrete by compaction factor test. Checking of files & viva	
		Week-5 (28-31 Oct.)	Checking of files & viva	
4	NOVEMBER	Week-1(4-8, Nov.)	To prepare concrete mix of a particular grade and determine compressive strength of concrete for 7 and 28 days. Checking of files & viva	
		Week-2(11-16, Nov.)		HOUSE TEST
		Week-3 (18-23, Nov.)	Demonstration of NDT equipment. Checking of files & viva	
		Week-4 (25-31, Nov.)	Checking of files & viva	

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