DEPARTMENT OF CIVIL ENGINEERING

GOVERNMENT POLYTECHNIC SUNDERNAGAR

| LESSON PLAN FOR Construction Materials (SEMESTER-3rd)SESSION: (Aug-Dec 2024) | | | | |
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| S.No. | MONTH | WEEK | CONTENTS | REMARKS |
| 1 | August | Week 1 | **Unit – I: Overview of Construction Materials:** Scope of construction materials in Building Construction, Transportation Engineering, Environmental Engineering, | |
| | | Week 2 | Irrigation Engineering (applications only). Selection of materials for different civil engineering structures based on strength durability, | |
| | | Week 3 | Eco friendly and economy. Broad classification of materials – Natural, Artificial, special, finishing andrecycled. | |
| | | Week 4 | **Unit – II: Natural Construction Materials: Requirements of good building stone; general characteristics of stone; quarrying and dressing methods and tools for stone.** | |
| | | Week 5 | Structure of timber, general properties and uses of good timber, different methods of seasoning for preservation of timber, defects in timber, | |
| 2 | September | Week 1 | use of bamboo in construction. Asphalt, bitumen, and tar used in construction, properties and uses. Properties of lime, its types and uses. | |
| | | Week 2 | Types of soil and its suitability in construction. Properties of sand and uses Classification of coarse aggregate according to size. **Class Test -1 Will be held this week.** | |
| | | Week 3 | **Unit- III: Artificial Construction Materials** : Constituents of brick earth, Conventional / Traditional bricks, Modular and Standard bricks, Special bricks –fly ash bricks, | |
| | | Week 4 | Characteristics of good brick, Field tests on Bricks, Classification of burnt clay bricks and their suitability, Manufacturing process of burnt clay brick, fly ash bricks, Aerated concrete blocks. Flooring tiles – Types, uses | |
| | | Week 5 | Manufacturing process of Cement - dry and wet (only flow chart), types of cement and its uses. Field tests on cement. Pre-cast concrete blocks- hollow, solid, pavement blocks, and their uses. | |
| | | Week 1 | Plywood, particle board, Veneers, laminated board and their uses.<br>Types of glass: soda lime glass, lead glass and borosilicate glass and their uses.<br>Ferrous and non-ferrous metals and their uses. | |
| | | Week 2 | **Unit– IV: Special Construction Materials:** Types of material and suitability in construction works of following materials: Water proofing, Termite proofing; | |

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| 3 | October | Week 3 | Thermal and sound insulating materials. Fibers – Types –Jute, Glass, Plastic Asbestos Fibers, (only uses). Geo polymer cement: Geo cement: properties, uses. **Class Test -2 Will be held this week.** | |
| | | Week 4 | **Unit– V: Processed Construction Materials** Constituents and uses of POP (Plaster of Paris), POP finishing boards, sizes, and uses.Paints-whitewash, cement paint, Distempers, Oil Paints and Varnishes with their uses. (Situations where used). | |
| | | Week 5 | Industrial waste materials- Fly ash, Blast furnace slag, Granite and marble polishing waste and their uses. | |
| 4 | November | Week 1 | Agro waste materials - Rice husk, Bagasse, coir fibers and their uses. Special processed construction materials; Geo synthetic, Ferro Crete, Artificial timber, Artificial sand, and their uses. | |
| | | Week 2 | **House Test will be held this week** | |
| | | Week 3 | Revision of Previous Year Question Papers | |
| | | Week 4 | Revision of Previous Year Question Papers | |
| | | Week 5 | Revision of Previous Year Question Papers | |
| 5 | December | Week 1 | Doubt Clearing Sessions & Discussion on Previous Years Question Papers | |

**Signature of Teacher**
(Er Ishan Sharma)

**Signature of H.O.D**
(Er Tanmay Kapoor)

## Department of Civil Engineering
## Government Polytechnic Sundernagar Distt Mandi (H.P) -175018

| Lesson Plan for Basic Surveying (Theory) (Semester- 3rd ) Session: (August- Dcember, 2024) | | | | |
|---|---|---|---|---|
| S.No | MONTH | WEEK | CONTENTS | REMARKS |
| 1 | August | 1 | **Unit –1 Overview and Classification of Survey** Survey- Purpose and Use. Types of surveying- Primary and Secondary, Classification: Plane, Geodetic, Cadastral, Hydrographic, Photogrammetry and Aerial. | |
| | | 2 | Principles of Surveying. Scales: Engineer's scale, Representative Fraction (RF) and diagonal scale. | |
| | | 3 | **Unit– 2 Chain Surveying** Instruments used in chain survey: Metric Chain, Tapes, Arrow, ranging rod, Line ranger, Offset rod, Open cross staff, Optical square. | |
| | | 4 | Chain survey Station, Base line, Check line, Tie line, Offset, Tie station. Ranging: Direct and Indirect Ranging. | |
| | | 5 | Methods of Chaining, obstacles in chaining, Errors in length: Instrumental error, personal error, error due to natural cause, random error. | |
| 2 | September | 1 | Principles of triangulation. Types of offsets: Perpendicular and Oblique. | |
| | | 2 | Conventional Signs, Recording of measurements in a field book. **Class Test - I as per academic calender issued by HPTSB.** | |
| | | 3 | **Unit– 3 Compass Traverse Survey** Compass Traversing- open, closed. Technical Terms: Geographic/ True Magnetic Meridians and Bearings | |
| | | 4 | Whole Circle Bearing system and Reduced Bearing system and examples on conversion of given bearing to another bearing (from one form to another) | |
| | | 5 | Fore Bearing and Back Bearing, Calculation of internal and external angles from bearings at a station, Dip of Magnetic needle, Magnetic Declination. | |
| 3 | October | 1 | Components of Prismatic Compass and their Functions, Methods of using Prismatic Compass-Temporary adjustments and observing bearings. | |
| | | 2 | Local attraction, Methods of correction of observed bearings - Correction at station and correction to included angles. | |
| | | 3 | Unit– 4 Leveling and Contouring Basic terminologies: Level surfaces, Horizontal and vertical surfaces, Datum, Benchmarks- GTS, Permanent, Arbitrary and Temporary **Class Test - II as per academic calender issued by HPTSB.** | |
| | | 4 | Reduced Level, Rise, Fall, Line of collimation, Station, Back sight, Fore sight, Intermediate sight, Change point, Height of instruments. | |

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| | | 5 | Level and its fundamental axes, Temporary adjustments of Level. Types of levels: Dumpy, Tilting, Auto level, Digital level, Components of Dumpy<br>Types of Levelling Staff: Self-reading staff and Target staff. Reduction of level by Line of collimation and Rise and Fall Method. | |
| 4 | November | 1 | Levelling Types: Simple, Differential, Fly, Profile and Reciprocal Levelling. Contour, contour intervals, horizontal equivalent. Uses of contour maps, Characteristics of contours, Methods of Contouring: Direct and indirect | |
| | | 2 | **House Test (Centralized) as per academic calender issued by HPTSB.** | |
| | | 3 | Unit– 5 Measurement of Area and Volume Components and use of Digital planimeter. Measurement of area using digital planimeter. | |
| | | 4 | Measurement of volume of reservoir from contour map. | |
| | | 5 | Revision of Unit 1 to Unit 3 | |
| 5 | December | 1 | Revision of Unit 4 & Unit 5 | |

**Note:- The Lesson Plan is tentative, subject to availaibility of time,students & faculty.**

**Signature of Teacher**
(Er Pratik Gupta)

**Signature of H.O.D**
(Er Tanmay Kapoor)

Department of Civil Engineering

Government Polytechnic Sundernagar Distt Mandi (H.P) -175018

| Lesson Plan for Mechanics of Materials (Semester-3rd ) Session: (August- December, 2024) | | | | |
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| **S.No** | **MONTH** | **WEEK** | **CONTENTS** | **REMARKS** |
| 1 | August | 1 | **Unit – 1 Moment of Inertia** Moment of inertia (M.I.): Definition, M.I. of plane lamina, Radius of gyration, section modulus | |
| | | 2 | Parallel and Perpendicular axes theorems (without derivations). M.I. of rectangle, square, circle, semi-circle, quarter circle and triangle section (without derivations). | |
| | | 3 | M.I. of symmetrical and unsymmetrical I-section, Channel section, T-section, Angle section Hollow sections about centroidal axes. Polar Moment of Inertia of solid circular sections. | |
| | | 4 | **Unit– 2 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. | |
| | | 5 | Standard stress strain curve for tor steel bar under tension, Yield stress, Proof stress, Ultimate stress, Strain at various critical points, Percentage elongation and Factor of safety | |
| 2 | September | 1 | Deformation of body due to axial force, forces applied at intermediate sections, Maximum and minimum stress induced, Composite section under axial loading | |
| | | 2 | Concept of temperature stresses and strain, Stress and strain developed due to temperature variation in homogeneous simple bar (no composite section) Longitudinal and lateral strain **Class Test - I as per academic calender issued by HPTSB.** | |
| | | 3 | 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). | |
| | | 4 | **Unit– 3 Shear Force and Bending Moment** Types of supports, beams, and loads. Concept and definition of shear force and bending moment. | |
| 3 | October | 1 | Relation between load, shear force and bending moment (without derivation) | |
| | | 2 | Shear force and bending moment diagram for cantilever and simply supported beams subjected to point loads , uniformly distributed loads (combination of any two types of loading), point of contra flexure | |
| | | 3 | **Unit– 4 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. **Class Test - II as per academic calender issued by HPTSB.** | |
| | | 4 | 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 and circular section, shear stress distribution diagram. | |
| | | 5 | Shear stress distribution for square, rectangular, circle, hollow, angle sections, channel section, I-section, T section. Simple numerical problems based on shear equation. | |

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| 4 | November | 1 | Revision of Unit 1 to Unit 4 | |
| | | 2 | **House Test (Centralized) as per academic calender issued by HPTSB.** | |
| | | 3 | **Unit– 5 Columns** Concept of compression member, short and long column, Effective length, Radius of gyration, Slenderness ratio, Types of end condition for columns, Buckling of axially loaded columns, Euler's theory, assumptions made in Euler's theory and its limitations, Application of Euler's equation to calculate buckling load, Rankine' s formula and its application to calculate crippling load. | |
| | | 4 | Concept of working load/safe load, design load and factor of safety. | |
| | | 5 | Doubt Clearing sessions | |

**Note:- The Lesson Plan is tentative, subject to availaibility of time,students & faculty.**

Signature of **Teacher**
(Er Pratik Gupta)

Signature of H.O.D
(Er Tanmay Kapoor)

**Department of Civil Engineering**

**Government Polytechnic Sundernagar Distt Mandi (H.P) -175018**

**Lesson Plan for Building Construction (Semester-3rd)Session: (Aug-Dec, 2024)**

| S.No | MONTH | | CONTENTS | REMARKS |
|---|---|---|---|---|
| 1 | Aug | Week1 | Unit – I: Overview of Building Components<br>□ Classification of Buildings as per National Building Code Group A to I, as per Types of ConstructionsLoad Bearing Structure, Framed Structure, Composite Structure. | |
| | | Week 2 | □ Building Components - Functions of Building Components, Substructure – Foundation, Plinth. | |
| | | Week3 | □ Superstructure – Walls, Partition wall, Cavity wall, Sill, Lintel, Doors and Windows, Floor, Roof, Columns,Beams, Parapet | |
| | | Week4 | Unit – II: Construction of Substructure<br>□ Job Layout: Site Clearance, Layout for Load Bearing Structure and Framed Structure by Center Line and | |
| | | Week5 | Face Line Method, Precautions.<br>□ Earthwork: Excavation for Foundation, Timbering and Strutting, Earthwork for embankment, Material for plinth Filling, Tools and plants used for earthwork. | |
| 2 | Sept | Week1 | □ Foundation: Functions of foundation, Types of foundation – Shallow Foundation, Stepped Footing, Wall Footing, Column Footing, Isolated and Combined Column Footing, Raft Foundation, Grillage Foundation. | |
| | | Week 2 | Deep Foundation - Pile Foundation, Well foundation.**( Class Test-1)** | |
| | | Week3 | Unit- III: Construction of Superstructure<br>□ Stone Masonry: Terms used in stone masonry- facing, backing, hearting, through stone, corner stone,cornice | |
| | | Week4 | 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 | |
| | | Week5 | Construction.<br>□ Brick masonry: Terms used in brick masonry- header, stretcher, closer, quoins, course, face, back, hearting,bat bond, joints, lap, frog line, level and plumb. Bonds in brick masonry- header bond, stretcher bond | |
| | | Week1 | English bond and Flemish bond. Requirements of good brick masonry. Junctions in brick masonry and their purpose and procedure. Precautions to be observed in Brick Masonry Construction. Comparison between stone and Brick Masonry. Tools and plants required for construction of stone and brick masonry. Hollow concrete block masonry and composite masonry. | |

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| 3 | Oct | Week 2 | Scaffolding and Shoring: Purpose, Types of Scaffolding, Process of Erection and Dismantling. Purpose andTypes of Shoring, Underpinning. Formwork: Definition of Formwork, Requirements of Formwork, Materials used in Formwork, Types of Formworks, Removal of formwork. | |
| | | Week3 | Unit– IV: Building Communication and Ventilation<br>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-2)** | |
| | | Week4 | 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. | |
| | | Week5 | 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 | Nov | Week1 | Unit– V: Building Finishes<br>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, | |
| | | Week 2 | Finishing and Polishing of Floors, Roofing Materials- RCC, Mangalore Tiles, AC Sheets, G.I. sheets,Corrugated G.I. Sheets, Plastic and Fibre Sheets. Types of Roofs: Flat roof, Pitched Roof-King Post truss,**(House Test)** | |
| | | Week3 | Queen Post Truss, terms used in roofs.<br>Wall Finishes: Plastering – Necessity of Plastering, Procedure of Plastering, Single Coat Plaster, DoubleCoat Plaster, Rough finish, Neeru Finishing and Plaster of Paris (POP). Special Plasters- Stucco plaster,sponge | |
| | | Week4 | 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. | |
| | | Week5 | Revision | |
| 5 | Dec | Week1 | Revision | |

**Note: Lesson Plan is Tentative, subject to availability of time, students and faculty**

**Signature of Teacher**
(Er Vibhor Sharma)

**Signature of H.O.D**
(Er Tanmay Kapoor)

## DEPARTMENT OF CIVIL ENGINEERING
## GOVERNMENT POLYTECHNIC SUNDERNAGAR

**LESSON PLAN FOR Concrete Technology (SEMESTER-3rd)SESSION: (Aug-Dec 2024)**

| S.No. | MONTH | WEEK | CONTENTS | REMARKS |
|---|---|---|---|---|
| 1 | August | Week 1 | **Unit – I Cement, Aggregates and Water :**Physical properties of OPC and PPC: fineness, standard consistency, setting time,soundness, compressive strength. | |
| | | Week 2 | Different grades of OPC and relevant BIS codes 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 Whitecement. | |
| | | Week 3 | Aggregates: 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 | Coarse aggregates: Properties, size, shape, surface texture, water absorption, soundness, specific gravity and bulk density, fineness modulus of coarse aggregate, grading of coarse aggregates, crushing value, impact value and abrasion value of coarse aggregates with specifications. | |
| | | Week 5 | Water: Quality of water, impurities in mixing water and permissible limits for solids as per IS: 456. | |
| 2 | September | Week 1 | **Unit– II Concrete** 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, | |
| | | Week 2 | maximum w/c ratio for different grades of concrete for different exposure conditions as per IS 456. **. Class Test -1 Will be held this week.** | |
| | | Week 3 | Properties of fresh concrete: Workability: Factors affecting workability of concrete. Determination of workability of concrete by slump cone, compaction factor, Vee-Bee Consistometer. | |
| | | Week 4 | Value of workability requirement for different types of concrete works. Segregation, bleeding, and preventive measures. Properties of Hardened concrete: Strength, Durability, Impermeability | |
| | | Week 5 | Unit– III Concrete Mix Design and Testing of Concrete : 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, | |

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| 3 | October | Week 1 | Interpretation, and co-relation of test results. Non- destructive testing of concrete: Rebound hammer test, working principle of rebound hammer and factor affecting the rebound index, Ultrasonic pulse velocity test as per IS 13311 (part 1 and 2), Importance of NDT tests. | |
| | | Week 2 | **Unit– IV Quality Control of Concrete** Concreting Operations: Batching, Mixing, Transportation, Placing, Compaction, Curing and Finishing of concrete. Forms for concreting: Different types of form works for beams, slabs, columns, materials used for form work, requirement of good form work. | |
| | | Week 3 | Stripping time for removal of form works per IS 456. Waterproofing: Importance and need of waterproofing, methods of waterproofing and materials used for waterproofing. **Class Test -2 Will be held this week.** | |
| | | Week 4 | Joints in concrete construction: Types of joints, methods for joining old and new concrete, materials used for filling joints. | |
| | | Week 5 | **Unit– V Chemical Admixture, Special Concrete and Extreme Weather concreting** Admixtures in concrete: Purpose, properties and application for different types of admixtures such as accelerating admixtures, retarding admixtures, water reducing admixtures, air entraining admixtures and super plasticizers. | |
| 4 | November | Week 1 | 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. | |
| | | Week 2 | **House Test will be held this week** | |
| | | Week 3 | Cold weather concreting: effect of cold weather on concrete, precautions to be taken while concreting in cold weather condition. | |
| | | Week 4 | Hot weather concreting: effect of hot weather on concrete, precautions to be taken while concreting in hot weather condition. | |
| | | Week 5 | Revision of Previous Year Question Papers | |
| 5 | December | Week 1 | Doubt Clearing Sessions & Discussion on Previous Years Question Papers | |

**Signature of Teacher**
(Er Garima Sharma)

**Signature of H.O.D**
(Er Tanmay Kapoor)

**Planning of Syllabus Coverage**
**(LESSON PLAN)**
**Government Polytechnic SunderNagar**
**Subject: Geotechnical Engg:3rdSem Trade: Civil Engg.**

**With Effect From: 01/ 08/24 Total Period Planned: 66**

| Weeks | Topics To Be Covered |
|---|---|
| Week 1 | Unit – I Overview of Geology and Geotechnical Engineering Introduction of Geology, Branches of Geology, Importance of Geology for civil engineering structure and composition of earth, |
| Week 2 | Definition of a rock: Classification based on their genesis (mode of origin), formation, Classification, and engineering uses of igneous, sedimentary, and metamorphic rocks. |
| Week 3 | Importance of soil as construction material in Civil engineering structures and as foundation bed for structures. |
| Week 4 | Field application of geotechnical engineering for foundation design. pavement design, design of earth retaining structures, design of earthen dam. |
| Week 5 | Soil as a three-phase system, water content, determination of water content by oven drying method as per• BIS code, void ratio, porosity and degree of saturation, density index. Unit weight of soil mass – bulk unit weight, dry unit weight, unit weight of solids, saturated unit weight, submerged unit weight. |
| Week 6 | Determination of bulk unit weight and dry unit weight by core cutter and sand replacement method, Consistency of soil, Atterberg limits of consistency: Liquid limit, plastic limit and shrinkage limit. Plasticity index. |
| Week 7 | Particle size distribution test and plotting of curve, Determination of effective diameter of soil, well graded• and uniformly graded soils, BIS classification of soil. Unit– III Permeability and Shear Strength of Soil Definition of permeability. Darcy's law of permeability, coefficient of permeability, factors affecting• permeability, determination of coefficient of permeability by constant head and falling head tests, |
| Week 8 | simple problems to determine coefficient of permeability. Seepage through earthen structures, seepage velocity, seepage pressure, phreatic line, flow lines, application of flow net, (No numerical problems) |
| Week 9 | Shear failure of soil, concept of shear strength of soil. Components of shearing resistance of soil – cohesion, internal friction |
| Week 10 | Mohr-Coulomb failure theory, Strength envelope, strength equation for purely cohesive and cohesion less soils. Direct shear and vane shear test – laboratory methods. |
| Week 11 | Unit– IV Bearing Capacity of Soil Bearing capacity and theory of earth pressure. Concept of bearing capacity, ultimate bearing capacity, safebearing capacity and allowable bearing pressure |
| Week 12 | Introduction to Terzaghi's analysis and assumptions, effect of water table on bearing capacity |

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| Week 13 | Field methods for determination of bearing capacity – Plate load and Standard Penetration Test. Test• procedures as per IS:1888 & IS:2131. |
| Week 14 | ? Definition of earth pressure, Active and Passive earth pressure for no surcharge condition, coefficient of earth pressure |
| Week 15 | HOUSE TEST |
| Week 16 | Unit– V Compaction and stabilization of soil Concept of compaction, Standard and Modified proctor test as per IS code, Plotting of Compaction curve• for determining: Optimum moisture content (OMC), maximum dry density (MDD), Zero air voids line. Factors affecting compaction, field methods of compaction – rolling, ramming and vibration. Suitability of various compaction equipment -smooth wheel roller, sheep foot roller, pneumatic tyre roller, Rammer and Vibrator, Difference between compaction and consolidation |
| Week 17 | Concept of soil stabilization, necessity of soil stabilization, different methods of soil stabilization. California• bearing ratio (CBR) test - Meaning and Utilization in Pavement Construction Necessity of site investigation and soil exploration: Types of exploration, criteria for deciding the location• and number of test pits and bores. Field identification of soil – dry strength test, dilatancy test and toughness test. |
| Week 18 | REVISION |

Er.Ritesh Bisht

(H.O.D Civil Engg.)

## DEPARTMENT OF CIVIL ENGINEERING
## GOVERNMENT POLYTECHNIC SUNDERNAGAR

**LESSON PLAN FOR Construction Materials Lab. (SEMESTER-3rd)SESSION: (Aug-Dec 2024)**

| S.No. | MONTH | WEEK | CONTENTS | REMARKS |
|---|---|---|---|---|
| 1 | August | Week 1 | Identify various sizes of available coarse aggregates from sample of 10 kg in laboratory and prepare report (60,40, 20,10 mm) | |
| | | Week 2 | Identify the available construction materials in the laboratory based on their sources. | |
| | | Week 3 | 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 4 | Prepare the lime putty by mixing lime (1 kg) with water in appropriate proportion and prepare report on slaking of lime. | |
| | | Week 5 | 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 | |
| 2 | September | Week 1 | 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 | |
| | | Week 2 | Select first class, second class and third-class bricks from the stake of bricks and prepare report on the basis of its properties. | |
| | | Week 3 | Measure dimensions of 10 bricks and find average dimension and weight. | |
| | | Week 4 | Perform field tests dropping, striking, and scratching by nail and correlate the results obtained. | |
| | | Week 5 | Identify different types of flooring tiles such as vitrified tiles, ceramic tiles, glazed tiles, mosaic tiles, anti- skid tiles, checkered tiles, paving blocks and prepare report about the specifications. | |
| 3 | October | Week 1 | Apply the relevant termite chemical on given damaged sample of timber. | |
| | | Week 2 | Identify the type of glasses from the given samples. | |
| | | Week 3 | 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 4 | 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 | |
| | | Week 5 | Viva Voce on Practicals | |

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| 4 | November | Week 1 | Prepare the cement mortar of proportion 1:3 or 1:6 using artificial sand as a special processed construction material. | |
| | | Week 2 | Prepare mortar using cement and Fly ash or Granite/marble polishing waste in the proportion 1:6 or 1:3. | |
| | | Week 3 | Viva Voce on Practicals | |
| | | Week 4 | Viva Voce on Practicals | |
| | | Week 5 | Doubt Clearing Sessions on Practicals Performed. | |
| 5 | December | Week 1 | Doubt Clearing Sessions on Practicals Performed. | |

**Signature of Teacher**
(Er Ishan Sharma)

**Signature of H.O.D**
(Er Tanmay Kapoor)

## Department of Civil Engineering
## Government Polytechnic Sundernagar Distt Mandi (H.P) -175018

| Lesson Plan for Basic Surveying (Practical G1& G2) (Semester - 3rd ) Session: (August- December, 2024) | | | | |
|---|---|---|---|---|
| **S.No** | **MONTH** | **WEEK** | **CONTENTS** | **REMARKS** |
| 1 | August | 1 | Measure distance between two survey stations using chain, tape and ranging rods when two stations are inter-visible. | |
| | | 2 | Undertake reciprocal ranging and measure the distance between two stations. | |
| | | 3 | Determine area of open field using chain and cross staff survey. Measure Fore Bearing and Back Bearing of survey lines of open traverse using Prismatic Compass. | |
| | | 4 | Measure Fore Bearing and back bearing of a closed traverse of 5 or 6 sides and correct the bearings and included angles for the local attraction. | |
| | | 5 | Undertake Survey Project with chain and compass for closed traverse for minimum 5 sides around a building. | |
| 2 | September | 1 | Plot the traverse on A1 size imperial drawing sheet for data collected in Survey Project mentioned at practical No.6. | |
| | | 2 | Undertake simple levelling using dumpy level/ Auto level and levelling staff. Undertake differential levelling and determine Reduced Levels by Height of instrument method and Rise and fall method using dumpy level/Auto Level and levelling staff | |
| | | 3 | Undertake fly levelling with double check using dumpy level/ Auto level and levelling staff. | |
| | | 4 | Undertake Survey Project with Levelling instrument for Profile levelling and cross- sectioning for a road with cross-section. | |
| 3 | October | 1 | Plot the L-section with minimum 3 cross-sections on A1 size imperial sheet for data collected in Survey Project mentioned at practical No.11. | |
| | | 2 | Undertake Survey Project for plotting contour map using block contouring method for a block of 150m x 150m with grid of 10m x 10m. | |
| | | 3 | Plot the contours on A1 size imperial drawing sheet for data collected in Survey Project mentioned at practical No.13. | |
| | | 4 | Measure area of irregular figure using Digital planimeter. | |
| 4 | November | 1 | Revision of Practical No. 1 & Viva - Voce | |
| | | 2 | Revision of Practical No. 2,3,4 & Viva - Voce | |
| | | 3 | Revision of Practical No. 5,6,7 & Viva - Voce | |
| | | 4 | Revision of Practical No. 8,9,10 & Viva - Voce | |
| | | 5 | Revision of Practical No. 11,12,13 & Viva - Voce | |

**Note:- The Lesson Plan is tentative, subject to availability of time,students & faculty.**

**Signature of Teacher**
(Er Pratik Gupta)

**Signature of H.O.D**
(Er Tanmay Kapoor)

## Department of Civil Engineering
## Government Polytechnic Sundernagar Distt Mandi (H.P) -175018

**Lesson Plan for Mechanics of Materials (Practical G1) (Semester- 3rd ) Session: (August-December, 2024)**

| S.No | MONTH | WEEK | CONTENTS | REMARKS |
|---|---|---|---|---|
| 1 | August | 2 | Study and understand the use and components of Universal Testing Machine (UTM). | |
| | | 3 | Checking of Practical- 1 & Viva- Voce. Perform Tension test on mild steel as per IS:432(1). | |
| | | 4 | Checking of Practical- 2 & Viva- Voce. Perform tension test on Tor steel as per IS:1608, IS:1139. | |
| | | 5 | Checking of Practical- 3 & Viva- Voce.Determine Water Absorption on bricks per IS:3495 (part II), IS:1077 or tile IS:1237. | |
| 2 | September | 1 | Checking of Practical- 4 & Viva- Voce.Determine Compressive strength of dry and wet bricks as per IS:3495(part I), IS:1077 | |
| | | 2 | Checking of Practical- 5 & Viva- Voce. Conduct Abrasion Test on flooring tiles (anyone) e.g., Mosaic tiles, Ceramic Tiles as per IS: 13630 (part7), Cement Tile as per IS: 1237. | |
| | | 3 | Checking of Practical- 6 & Viva- Voce. 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 | |
| | | 4 | Checking of Practical- 7 & Viva- Voce. Plot Shear force and Bending Moment diagrams for simply supported beams. | |
| 3 | October | 1 | Checking of Practical- 8 & Viva- Voce.Conduct Flexural test on timber beam on rectangular section in both orientations as per IS:1708, IS:2408. | |
| | | 2 | Checking of Practical- 9 & Viva- Voce. Conduct Flexure test on floor tiles IS:1237, IS:13630 or roofing tiles as per IS:654, IS:2690. | |
| | | 3 | Checking of Practical 10 & Viva - Voce | |
| | | 4 | Revision of Practicals & Viva - Voce | |
| | | 5 | Revision of Practicals & Viva - Voce | |
| 4 | November | 2 | Revision of Practicals & Viva - Voce | |
| | | 3 | Revision of Practicals & Viva - Voce | |
| | | 4 | Revision of Practicals & Viva - Voce | |
| | | 5 | Revision of Practicals & Viva - Voce | |

**Note:- The Lesson Plan is tentative, subject to availaibility of time,students & faculty.**

**Signature of Teacher**
(Er Pratik Gupta)

**Signature of H.O.D**
(Er Tanmay Kapoor)

## Department of Civil Engineering
## Government Polytechnic Sundernagar Distt Mandi (H.P) -175018

**Lesson Plan for Mechanics of Materials (Practical G2) (Semester- 3rd ) Session: (August-December, 2024)**

| S.No | MONTH | WEEK | CONTENTS | REMARKS |
|---|---|---|---|---|
| 1 | August | 2 | Study and understand the use and components of Universal Testing Machine (UTM). | |
| | | 3 | Checking of Practical- 1 & Viva- Voce. Perform Tension test on mild steel as per IS:432(1). | |
| | | 4 | Checking of Practical- 2 & Viva- Voce. Perform tension test on Tor steel as per IS:1608, | |
| | | 5 | Checking of Practical- 3 & Viva- Voce.Determine Water Absorption on bricks per IS:3495 (part | |
| 2 | September | 1 | Checking of Practical- 4 & Viva- Voce.Determine Compressive strength of dry and wet bricks as per IS:3495(part I), IS:1077 | |
| | | 2 | Checking of Practical- 5 & Viva- Voce. Conduct Abrasion Test on flooring tiles (anyone) e.g., Mosaic tiles, Ceramic Tiles as per IS: 13630 (part7), Cement Tile as per IS: 1237. | |
| | | 3 | Checking of Practical- 6 & Viva- Voce. 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 | |
| | | 4 | Checking of Practical- 7 & Viva- Voce. Plot Shear force and Bending Moment diagrams for simply supported beams. | |
| | | 5 | Checking of Practical- 8 & Viva- Voce.Conduct Flexural test on timber beam on rectangular section in both orientations as per IS:1708, IS:2408. | |
| 3 | October | 2 | Checking of Practical- 9 & Viva- Voce. Conduct Flexure test on floor tiles IS:1237, IS:13630 or | |
| | | 3 | Checking of Practical 10 & Viva - Voce | |
| | | 4 | Revision of Practicals & Viva - Voce | |
| | | 5 | Revision of Practicals & Viva - Voce | |
| 4 | November | 2 | Revision of Practicals & Viva - Voce | |
| | | 3 | Revision of Practicals & Viva - Voce | |
| | | 4 | Revision of Practicals & Viva - Voce | |
| | | 5 | Revision of Practicals & Viva - Voce | |
| 5 | December | 1 | Revision of Practicals & Viva - Voce | |

**Note:- The Lesson Plan is tentative, subject to availaibility of time,students & faculty.**

**Signature of Teacher**
(Er Pratik Gupta)

**Signature of H.O.D**
(Er Tanmay Kapoor)

## DEPARTMENT OF CIVIL ENGINEERING
## GOVERNMENT POLYTECHNIC SUNDERNAGAR

**LESSON PLAN FOR Concrete Technology Lab. (SEMESTER-3rd)SESSION: (Aug-Dec 2024)**

| S.No. | MONTH | WEEK | CONTENTS | REMARKS |
|---|---|---|---|---|
| 1 | August | Week 1 | Determine fineness of cement by Blaine's air permeability apparatus or by sieving. | |
| | | Week 2 | Checking of Practical Files | |
| | | Week 3 | Determine specific gravity, standard consistency, initial and final setting times of cement. | |
| | | Week 4 | Checking of Practical Files | |
| | | Week 5 | Determine compressive strength of cement. | |
| 2 | September | Week 1 | Checking of Practical Files | |
| | | Week 2 | Determine silt content in sand. | |
| | | Week 3 | Determine bulking of sand. | |
| | | Week 4 | Checking of Practical Files | |
| | | Week 5 | Determine bulk density of fine and coarse aggregates. | |
| 3 | October | Week 1 | Determine water absorption of fine and coarse aggregates. | |
| | | Week 2 | Determine Fineness modulus of fine aggregate by sieve analysis. | |
| | | Week 3 | Determine elongation and flakiness index of coarse aggregates | |
| | | Week 4 | Determine workability of concrete by slump cone test. | |
| | | Week 5 | Determine workability of concrete by compaction factor test. | |
| 4 | November | Week 1 | To prepare concrete mix of a particular grade and determine compressive strength of concrete for 7 and 28 days. | |
| | | Week 2 | Checking of Practical Files | |
| | | Week 3 | Demonstration of NDT equipment. | |
| | | Week 4 | Checking of Practical Files | |
| | | Week 5 | Checking of Practical Files | |
| 5 | December | Week 1 | Checking of Practical Files | |

Signature of Teacher
(Er Graima Sharma)

Signature of H.O.D
(Er Tanmay Kapoor)