Name Of The Faculty : G.P.Singh/Suman Yadav

Discipline : Civil Engg.

Semester : 3rd Sem.

Subject : Fluid Mechanics

Lesson Plan Duration : 14Weeks

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Theory** | | **Practical** | |
| **Lecture** | **Topic (including assignment / test)** | **Practica l** | **Topic** |
| **Day** | **Day** |
| 1. | 1 | Introduction:  Fluids: Real and ideal fluids  Fluid Mechanics, Hydrostatics, Hydrodynamics, Hydraulics | 1. | Brief Introduction of Practicals. |
| 2. | Properties of Fluids (definition only 2.1Mass density, specific weight, specific gravity, viscosity, surface tension - cohesion, adhesion and, capillarity, vapour pressure and  compressibility |
| 2. | 1. | Hydrostatic Pressure:  Pressure, intensity of pressure  pressure head, | 2. | 1 To verify Bernoulli’s Theorem |
| 2. | Pascal's law and its applications. Total pressure, resultant pressure, and centre ofpressure. |
| 3. | 1. | Total pressure and centre of pressure on horizontal, vertical and inclined plane surfaces of rectangular, triangular, trapezoidal shapes and circular.(No derivation - Simple Numerical  Problems) | 3. | DO |
| 2. | Measurement of Pressure Atmospheric  pressure, gauge pressure,DO |
| 4. | 1. | **Class Test/ Assignment I** | 4. | 2 To find out venturimeter coefficient |
| 2. | Vacuum pressure and absolute pressure. Piezometer, simple  manometer and differential manometer |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5. | 1. | Bourden gauge and dead weight pressure gauge.  Fundamentals of Fluid Flow:  Types of Flow: Steady and unsteady flow, laminar and turbulent flow,  uniform and non-uniform flow | 5. | DO |
| 2. | **1st Sessional Test** |
| 6. | 1. | Discharge and continuity Equation (flow equation) {Noderivation}, Simplenumerical problems.  Equation (flow equation)  {No derivation}, Simple numerical problems. | 6. | 3 To determine coefficient of velocity (Cv), Coefficient of discharge (Cd) Coefficient of contraction (Cc) of an orifice and verify the relation between them |
| 2. | Types of hydraulic energy: Potential energy,  kinetic energy, pressure energy  Bernoulli's theorem; statement and description  (without proof of theorem), Simple numerical problems. |
| 7. | 1. | Flow Measurements  Brief description with simple numerical problem of 6.1:Venturimeter and orifice meter | 7. | DO |
| 2. | Pitot tube  Orifices and mouthpieces  Current meters  Notches and weirs |
| 8. | 1 | Flow through Pipes:  Definition of pipe flow; Reynolds number, laminar and turbulent flow - explained through Reynold's experiment | 8. | 4 To perform  Reynold's experiment |
| 2. | Critical velocity and velocity distributions in a  pipe for laminar flow  Head loss in pipe lines due |
| 3. | to friction, sudden  expansion and sudden contraction, entrance, exit, obstruction and change of direction (No derivation of formula), Simple numerical  problems |
| 9. | 1. | **Class Test/ Assignment II** | 9. | To verify loss of head  in pipe flow due to a)Sudden enlargement   1. Sudden contraction 2. Sudden bend |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2. | Hydraulic gradient line and total energy line Pipes in series and parallel |  |  |
| 10. | 1. | Water hammer phenomenon and its effects  (only definition and description) | 10. | DO |
| 2. | **2nd Sessional Test** |
| 11. | 1. | Flow through open channels:  Definition of an open channel, uniform flow and non-uniform flow  Discharge through channels using  i) Chezy's formula (no derivation) | 11. | 6)Demonstration of use of current meter and pitot tube |
| 2. | ii)Manning's formula (no derivation) |
| 12. | 1. | Most economical channel sections (no derivation, only simple numerical  problems)i)Rectangular | 12. | 7)To determine coefficient of discharge of a rectangular notch  and triangular notch |
| 2. | ii)Trapezoidal |
| 13. | 1. | Head loss in open channel due to friction  Hydraulic Pumps:  Reciprocating pump | 13. | DO |
| 2. | centrifugal pumps |
| 14. | 1. | **Class Test/ Assignment III** | 14. | REVISION |
| 2. | **3rd Sessional Test** |

Name Of Faculty : Kuldeep Singh

Discipline : Civil Engg.

Semester : 3rd

Subject : Surveying-I

Lesson Plan Duration : 14 Weeks

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Week** | | **Theory** | | **Practical** | | |
| **Lecture** | **Topic (including assignment / test)** | **Practical** | **Topic** | |
| **Day** | **Day** |
| 1 | | 1. | 1. Introduction:    1. Basic principles of surveying | 1 | Brief Introduction To Practicals. | |
| 2 | 1.2 Concept and purpose of surveying, measurements-linear and angular, units of measurements | 2 | I. Chain surveying  i) a) Ranging a line  b) Chaining a line and recording in the field book. | |
| 2. | | 1. | 1.3 Instruments used for taking these measurements, classification based on surveying instruments | 1 | 1. Taking offsets - perpendicular and oblique (with a tape only) 2. Setting out right angle with a tape | |
| 2. | Chain surveying:  Purpose and principles of Chain Surveying  2.2 Introduction, advantages and disadvantages | 2 | ii) Chaining of a line involving reciprocal ranging | |
| 3. | | 1. | 2.3 Direct and indirect ranging, offsets and recording of field notes  2.4 Obstacles in Chain Surveying | 1 | iii)Chaining a line involving obstacles to ranging | |
| 2. | 2.5Errors in Chain Surveying and their correction | 2 | iv)Chain Survey of a | |
| 4. | 1. | | 3.Compass surveying:  3.1 Purpose of compass surveying. Use of prismatic compass: Setting and taking observations | 1. | III Compass Surveying:  i) a) Study of prismatic  compass | |
| 2. | | 3.2 Concept of following with simple numerical problems:  a) Meridian - Magnetic and true, Arbitrary | 2. | b) Setting the compass and taking observations | |
| 5. | 1. | | Bearing - Magnetic, True and Arbitrary Whole circle bearing and reduced bearing  Fore and back bearing  Magnetic dip and declination | 1 | c) Measuring angles between the lines meeting at a point | |
| 2. | | **1st Sessional Exam** | 2. | III. Levelling:  i) a) Study of dumpy level and levelling staff  b) Temporary  adjustments of various levels | |
| 6. | 1. | | 3.3 Local attraction - causes, detection errors and corrections | 1. | c) Taking staff  readings on different stations from the single setting and finding differences of level between  them | |
| 2. | | problems on local attraction | 2. | ii) a) To find out difference of level between two distant points by shifting the  instrument | |
| 7. | 1 | | magnetic declination and calculation of included angles in a compass traverse (Simple  Numerical Problems) | 1 | iii) Longitudinal and cross  sectioning of a road/railway/canal | |
| 2. | | 1. Levelling:    1. Purpose of levelling, concept of a level surface, horizontal surface, vertical surface, datum, reduced level and bench marks | 2 | iv) Setting a gradient by dumpy and auto- level | |
|  |  | |  |  |  | |
| 8 | 1. | | 2Identification of various parts of Dumpy level and use of Dumpy level, Engineer’ level, Auto level: advantages and disadvantages, use of auto level.  **Assignment II** | 1 | IV.Plane Table Surveying:  i) a) Study of the plane table survey equipment | |
| 2. | | 4.3 Concepts of line of collimation, axis of the bubble tube, axis of the telescope and vertical axis | 2. | b) Setting the  plane table | |
| 9. | 1. | | 4.4Levelling staff: single piece, folding, invar precision staff, telescopic  4.5Temporary adjustment and permanent adjustment of dumpy level by two peg  method. | 1. | c) Marking the North direction | |
| 2. | | 4.6 Concept of back  sight, foresight, intermediate sight, change point, to determine reduce  levels | 2. | d) Plotting a few  points by radiation method | |
| 10. | 1. | | 4.7Level book and  reduction of levels by 4.7.1Height of collimation method and  4.7.2 Rise and fall method | 1 | ii) a) Orientation by   * Trough compass * Back sighting | |
| 2. | | **2nd Sessional Exam** | 2. | b)Plotting few points  by intersection, radiation and resection method | |
| 11. | 1. | | 4.8 Arithmetic checks  4.9 Computations of Areas of regular figures and irregular figures. Simpson’s rule: prismatic formula and graphical method use of planimeter for computation of areas, numerical problems | 1 | iii) Traversing an area with a plane table (at least five lines) | |
|  |  | |  |  |  |
| 2. | | 1. Plane Table Surveying    1. Purpose of plane table surveying, equipment used in plane table survey: |  | V.Layout of Buildings (from given drawing of two room residential building) by use of surveying instruments |
| 12. | 1. | | 5.2 Setting of a plane table:   1. Centering   Levelling  (c) Orientation | 1 | REVISION |
| 2. | | 5.3 Methods of plane table surveying (a)Radiation,  (b) Intersection   1. Traversing   (d)Resection | 2. | REVISION |
| 13. | 1. | | **Class Test/Assignment III** | 1. | REVISION |
| 2. | | 5.4 Concept of Two point and Three  point problems (Concept only) | 2. | REVISION |
| 14. | 1. | | 5.5Errors in plane table survey and  precautions to control them. Testing and adjustment of plane table and alidade | 1. | REVISION |
| 2. | | **3rd Sessional Exam** | 2. | REVISION |

Name Of TheFaculty : GP Singh

Discipline : Civil Engg.

Semester : 3RD Sem.

Subject : Structural Mechanics Lesson Plan Duration : 14 Weeks

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Theory** | | **Practica l** | |
| **Lecture** | **Topic (including assignment / test)** | **Practica l** | **Topic** |
| **Day** | **Day** |
| 1. | 1 | 1. Properties of Materials    1. Classification of materials, elastic materials, plastic materials, ductile materials, brittle materials. | 1. | i)Determination of yield stress, ultimate stress, percentage elongation and plot the stress strain diagram and compute the value of young's modulus on mild steel |
| 2. | 1.2 Introduction to tensile test, compressive test, impact test, fatigue test, torsion test on metals. |
| 3. | 1. Simple Stresses and Strains    1. Concept of stress, normal and shear stresses |
| 4 | Do |
| 2. | 1. | 2.2 Concept of strain and deformation,  longitudinal and transverse strain, | 2. | DO |
| 2. | poisson's ratio, volumetric strain |
| 3. | 2.3 Hooke's law, modulii of elasticity and rigidity, Bulk modulus of elasticity, relationship between the elastic constants. |
| 4. | Revision |
| 3. | 1. | 2.4 Stresses and strains in bars subjected to tension and compression. Extension of uniform bar under its own weight | 3. | ii)Testing of HYSD Steel |
| 2. | stress produced in compound bars (two  or tPeriodsee) due to axial load |
| 3. | 2.5 Stress-strain diagram for mild steel and HYSD steel, mechanical properties, factor of safety. |
| 4. | **Class Test /Assignment I** |
| 4. | 1. | 2.6 Temperature stresses and strains | 4. | DO |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| 2. | 3. Shear Force and Bending Moment: 3.1  Concept of a beam and supports (Hinges, Roller and Fixed), |
| 3. | types of beams: simply supported, cantilever, propped, over hang, cantilever and continuous beams (only concept). |
| 4. | 3.2 Types of loads (dead load, live load, snow load, wind load seismic load as per IS Codes etc) and types of loading (point, uniformly distributed and uniformly varying loads) |
| 5. | 1. | Revision | 5. | iii)Determination of Young's modulus of elasticity for steel wire with searl's apparatus |
| 2. | Revision |
| 3. | **First Sessional** |
| 6. | 1. | 3.3 Concept of bending moment and  shear force, sign conventions | 6. | DO |
| 2. | 3.4 Bending Moment and shear force diagrams for cantilever, simply supported and overhanging beams subjected to concentrated, uniformly distributed |
| 3. | DO |
| 4. | Numerical Practice |
| 7. | 1. | 3.5Relationship between load, shear force and bending moment, point of maximum bending moment, and point of contraflexure. | 7. | iv) Determination of modulus of rupture of a concrete beam |
| 2. | DO |
| 3. | 4.Moment of Inertia: Concept of moment of inertia and second moment of area and radius of gyration, theorems of parallel and perpendicular axis |
| 4. | Numerical  Practice |
| 8. | 1. | Second moment of area of common geometrical sections: rectangle, triangle, circle *(without derivations).* | 8. | DO |
| 2. | Second moment of area for L, T and I sections, section modulus. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 3. | 1. Bending Stresses in Beams:    1. Concept of pure/simple bending | |  |  |
| 4. | 5.2 Assumptions made in the theory of simple bending, derivation and application of bending equation to circular cross-section, I section, T&L  sections only | |
| 9. | 1. | **Class Test/Assignment II** | | 9. | v)Determination of maximum deflection and young's modulus of elasticity in simply supported beam with load at middle third point |
| 2. | Moment of resistance Calculations of bending stresses in simply supported beam | |
| 3. | 1. Shear Stresses in Beams    1. Concept of shear stresses in beams, | |
| 4. | shear stress distribution in rectangular,  circular I, T, L sections for S.S. beams and Portland | |
| 10. | 1. |  | Do | 10. | DO |
|  |
| 2. | **Revision** | |
| 3. | **Second Sessional** | |
| 11. | 1. | 7.Slope and Deflection:Determination of slope and deflection using Moment Area Theorem for simply supported beam for pointed load and U.D.L.(no derivation, numerical problems) | | 11. | DO |
| 2. | DO | |
| 3. | DO | |
| 12 | 1. | 8.Columns: 8.1Theory of columns | | 12. | vi)Verification of forces in a framed structure |
| 2. | 8.2 Problem solving using Eulers and Rankine Formula | |
| 3 | Do | |
| 4. | --------DO-------- | |
| 13. | 1. | 1. Analysis of Trusses:    1. Concept of a perfect, redundant and deficient frames | | 13. | DO |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| 2. | 9.2 Assumptions and analysis of trusses by:  a) Method of joints |
| 3. | b)Method of sections |
| 4. | **Class Test /Assignment III** |
| 14. | 1. | Revision | 14. | DO |
| 2. | Revision |
| 3. | Full Syllabus Test |

NameOfTheFaculty : SumanYadav/Krishan Kumar

Discipline : CivilEngg.

Semester : 3rdSemester

Subject : BuildingConstruction

LessonPlan Duration : 15 Weeks

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Week** | | **Theory** | | **Practical** | | |
| **Lecture** | **Topic(includingassignment/test)** | **Practica l** | | **Topic** |
| **Day** | **Day** | |
| 1. | | 1. | 1. Introduction:    1. Definition of a building, classificationofbuildingsbasedon occupancy    2. Differentpartsofabuilding | 1. | | 1 Demonstration of toolsandplantsused in building construction |
| 2. | 1. Foundations:    1. Conceptoffoundationandits purpose   2.2Typesoffoundation- shallow and deep |
| 2. | | 1. | 2.2.1Shallowfoundation constructionaldetails | 2. | | 2ToprepareLayout of a building: two roomsbuildingwith front verandah |
| 2. | 2.2.2Introductiontodeepfoundation and their types  2.3.Earthwork 2.3.1Layout/setting out for surfaceexcavation,cuttingand  filling |
| 3. | 1. | | 2.3.2Excavationoffoundation, trenches,shoring,timberingand de- watering.   1. Walls:    1. Purposeofwalls    2. Classification of walls - load bearing,non-loadbearing,dwarfwall, retaining, breast walls and partition walls | | 3. | 3 To construct brick bonds(Englishbond only) in one, one and half and two brick thick: (a) Walls for L, T and cross junction (b) Columns |
|  |  | |  | |  |  |
| 2. | | 3.3 Classification of walls as per materials of construction: brick, stone, reinforced brick, reinforced concrete,precast,hollowandsolid concrete block and composite  Masonrywalls  3.4 Partition walls | |
| 4. | 1. | | 3.5Scaffolding,constructiondetails and suitability of mason’s brick layers and tubular scaffolding, shoring,  underpinning | | 4. | 4 Demonstration of following items of workatconstruction site by:  a)Timberingof excavated trenching |
| 2. | | 4Masonry  4.1BrickMasonry  4.1.1Bond | |
| 5. | 1. | | 4.1.3Mortars:types,selectionof mortar and its preparation  4.2StoneMasonry  Glossary of terms – natural bed, beddingplanes,stringcourse,corbel, cornice, block in course grouting, moulding, templates, corner stone,  bond stone, throating, through stone, parapet,coping,pilastersandbuttress | | 5. | 4.2.2Typesofstonemasonry:rubble masonry - random and coursed; Ashlar masonry, principles to be observed in construction of stone masonry walls |
| 2. | | **FirstSessionalExam** | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6. | 1. | | 1. Archesand Lintels:    1. Meaninganduseofarches and lintels:    2. Glossary of terms used in arches andlintels-abutment,pier,archring, intrados, soffit, extrados, voussoirs, springer, springing line, crown, key stone, skewback,span,rise, depth ofan arch, haunch, spandril, jambs,   bearing,thicknessoflintel,effective span | | 6. | | b)Layingdamp proof courses | |
| 2. | | * 1. Arches:      1. TypesofArches-Semicircular, segmental, elliptical and parabolic, flat, inverted and relieving   5.3.2Stonearchesand their construction  5.3.3Brickarchesand their construction | |
| 7. | 1. | | * 1. Lintels   Purposeof lintel  5.4.3Cast-in-situand pre-cast  5.4.4lintels  Lintelalongwithsun-shadeor chhajja | | 7. | | c)Constructionof masonry walls | |
| 2. | | 6. Doors, Windows and Ventilators:6.1Glossaryof terms with neat sketches  6.2Classification based on materialsi.e.wood,metaland plasticandtheirsuitabilityfor different situations. Different  typeofdoors-paneldoor,flush | |
|  |  | |  | |  | |  | |
|  | |  | | 7.DampProofingandWaterProofing | |  | | 6.3Window | |
|  | | 1. | | 7.1Dampnessanditsilleffectsonbricks,  plaster,woodenfixtures,metalfixtures and | |  | | 6.4Doorandwindow frames–  materialsandsections,fixtures and fasteners, hold fasts | |
| 8. | |  | |  | | 8. | |  | |
|  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |
|  | |  | | 7.2Sourcesof dampnes  7.3Dampproofingmaterials | |  | |  | |
|  | |  | |  | |  | |  | |
|  | | 2. | |  | |  | |  | |
|  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9. | | 1. | | | 1. Floors   Glossaryofterms-floorfinish,topping, underlayer,basecourse,rubblefillingand their purpose | | | 9. | | | e)Plasteringand pointingexercise | | |
| 2. | | | * 1. 8.2 Types of floor finishes - concrete flooring, ceramic tile flooring, stone (marble and kota) flooring. Wooden flooring | | |
| 10. | | 1. | | | batten,eaves,faciaboard,gable,hip,lap, purlin, rafter, rag bolt, valley, ridge, rain water gutter, anchoring bolts  9.3Falseceilingsusinggypsum,plaster boards, cellotex, fibre boards | | | 10. | | | Revision | | |
| 2. | | | **SecondSessionalExam** | | |
|  |  | | |  | | |  | | |  | | |
| 11. | 1. | | | 1. Stairs    1. Glossary of terms: Staircase, winders, landing, stringer, newel, baluster,riser,tread,widthofstaircase,   hand-rail,nosing | | | 11. | | | f)ConstructingRCCwork | | |
| 2. | | | 10.2Classificationofstaircaseonthe  basis of material – RCC, timber, steel, Aluminium  10.3Planning and layout of staircase | | |
| 12. | 1. | | | 1. SurfaceFinishes    1. Plastering-classificationaccordingto use and finishes like plain plaster, grit finish, roughcast, pebbledashed, concrete and stone cladding etc., dubbing, proportion of mortars used for different   plasters,techniquesofplasteringand curing | | | 12. | | | g)Pre-construction and postconstructiontermite treatment of building and woodwork | | |
| 2. | | | 11.2Pointing-differenttypesofpointing and their methods.11.3Painting - preparation of surface, primer coat and application of paints on wooden,steelandplasteredwallsurfaces | | |
| 13. | 1. | | | 11.4Applicationofwhitewashing,colour  washing and distempering, polishing, applicationofcementandplasticpaints  11.5 Selection of appropriate paints/finishesforinteriorandexterior surfaces | | | 13. | | | h)Interlockingtiles | | |
| **2** | | | 11.6 Importance of preparation of surfacessuchashacking,groovingetc before application of surface finishes | | |
| 14. | | | 1. | | | AntiTermiteTreatment | | | 14. | | | REVISION | | |
| 2. | | | **ThirdSessionalExam** | | |