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| **Name of the Faculty** | | | | **:** |  |  |  |
| **Discipline** | |  |  | **:** | **Civil Engg.** |  |  |
| **Semester** | |  |  | **:** | **4th Sem.** |  |  |
| **Subject** | |  |  | **:** | **CONCRETE TECH.** |  |  |
| **Lesson Plan Duration** | | | | **:** | **15 weeks** |  |  |
|  |  |  |  |  |  |  |  |
| **Week** |  | **Theory** |  |  |  | **Practical** |  |
|  |  | **Lecture** | **Topic (including assignment / test)** | | | **Practical** | **Topic** |
|  |  | **Day** |  |  |  | **Day** |  |
| 1. |  | 1 | Introduction: Definition of concrete, properties of concrete, uses of concrete in comparison to other building materials | | | 1. | To determine the Physical properties of cement as per IS Codes. |
|  |  | 2. | Advantages and disadvantages of concrete. | | |  |  |
|  |  | 3. | 2.Ingredients of Concrete2.1 Cement: physical properties of cement; different types of cement as per IS Codes | | |  |  |
| 2. |  | 1. | Aggregates:  2.2.1 Classification of aggregates according to size and shape | | | 2. | To determine Flakiness and elongation  Index of coarse aggregates. |
|  |  | 2. | 2.2.2 Characteristics of aggregates: Particle size and shape, surface texture, specific gravity of aggregate; bulk density, water absorption, surface moisture, bulking of sand, deleterious materials soundness | | |  |  |
|  |  | 3. | 2.2.3 Grading of aggregates: coarse aggregate, fine aggregate; All-in- aggregate; fineness modulus; interpretation of grading charts | | |  |  |
| 3. |  | 1. | 2.3 Water: Water Quality requirements as per IS:456-2000 | | | 3. | To determine Silt in fine aggregate. |
|  |  | 2. | 3.Water Cement Ratio: 3.1 Hydration of cement principle of water-cement ratio, Duff Abram’s Water-cement ratio law: | | |  |  |
|  |  | 3. | Limitations of water-cement ratio law and its effects on strength of concrete | | |  |  |
| 4. |  | 1. | 4.Properties of Concrete 4.1 Properties in plastic state: Workability, Segregation, | | | 4. | Determination of Specific gravity and water absorption of aggregates. |
|  |  | 2. | Bleeding and Harshness | |  |  |  |
|  |  | 3. | 4.1.1Factors affecting workability, Measurement of workability: slump test, compacting factor and Vee Bee consistometer; | | |  |  |
| 5. |  | 1. | Recommended slumps for placement in various conditions as per IS:456-2000/SP-23 | | | 5. | Determination of Bulk density and void of aggregates. |
|  |  | 2. | Properties in hardened state: Strength, Durability, Impermeability, Dimensional changes; | |  |  |  |
|  |  | 3. | 5. Concrete Mix Design 5.1Objectives of mix design, introduction to various grades as per IS:456-2000; proportioning for nominal mix design as prescribed by IS 456-2000 | | |  |  |
| 6. |  | 1. | First Sessional and Assignment | |  | 6. | Determination of Particle size distribution of fine, coarse and all in aggregates by sieve analysis |
|  |  | 2. | 5.2 Adjustment on site for: Bulking of fine aggregate, water absorption of aggregate, workability | | |  |  |
|  |  | 3. | 5.3 Difference between nominal and controlled concrete 5.4. Introduction to IS-10262-2009-Code for controlled mix design. | | |  |  |
| 7. |  | 1. | 6. Introduction to Admixtures (chemicals and minerals) for improving performance of concrete | | | 7. | Revision |
|  |  | 2 | DO | | |  |  |
|  |  | 3. | 7. Special Concretes (only features) | | |  |  |
|  |  |  |  | |  |  |  |
| 8. |  | 1. | 7.1Concreting under special conditions, difficulties and precautions before, during and after concreting  7.1.1 Cold weather concreting  7.1.2 Under water concreting  7.1.3 Hot weather concreting | | | 8. | Viva-voce |
|  |  | 2. | 7.2 Ready mix concrete7.3 Fibre reinforced concrete | | |  |  |
|  |  | 3. | 7.4 Polymer Concrete 7.5 Fly ash concrete  7.6 Silica fume concrete | | |  |  |
| 9. |  | 1. | 8. Concreting Operations: 8.1 Storing of Cement:  8.1.1 Storing of cement in a warehouse  8.1.2 Storing of cement at site  8.1.3 Effect of storage on strength of cement | | | 9. | To determine necessary Adjustment for bulking of fine aggregates. |
|  |  | 2. | 8.1.4 Determination of warehouse capacity for storage of Cement | | |  |  |
|  |  | 3. | 8.2 Storing of Aggregate: Storing of aggregate at site | | |  |  |
| 10. |  | 1. | 8.3 Batching (to be shown during site visit )  8.3.1 Batching of Cement | | | 10. | To determine workability by Slump test |
|  |  | 2. | 8.3.2 Batching of aggregate by:  8.3.2.1 Volume, using gauge box (farma) selection of proper gauge box | | |  |  |
|  |  | 3. | 8.3.2.2 Weight spring balances and batching machines 8.3.3 Measurement of water | | |  |  |
| 11. |  | 1. | 8.4 Mixing:  8.4.1 Hand mixing  8.4.2 Machine mixing - types of mixers, capacities of mixers, choosing appropriate size of mixers, operation of mixers | | | 11. | To verify the Effect of water, aggregate/cement |
|  |  | 2. | 8.4.3 Maintenance and care of mixers | | |  | ratio on slump |
|  |  |  |  | | |  |  |
|  |  | 3. | Second Sessional and Assignment | | |  |  |
|  |  |  |  | | |  |  |
| 12. |  | 1. | 8.5 Transportation of concrete: Transportation of concrete using: wheel barrows, transit mixers, chutes, belt conveyors, pumps, tower crane and hoists etc. | | | 12. | Compaction factor test for workability. |
|  | 2. | 8.6 Placement of concrete:  Checking of form work, shuttering and precautions to be taken during placement | | |
| 3 | | 8.7 Compaction:  8.7.1Hand compaction    8.7.2 Machine compaction - types of vibrators, internal screed vibrators and form vibrators  8.7.3 Selection of suitable vibrators for different situations | | |
| 13. | 1. | | 8.8 Finishing concrete slabs - screeding, floating and trowelling | | | 13. | Non destructive test on concrete. |
|  | 2. | | 8.9 Curing:  8.9.1Objective of curing, methods of curing like ponding, membrane curing, steam curing, chemical curing  8.9.2 Duration for curing and removal of form work | | |  |  |
|  | 3. | | 8.10 Jointing: Location of construction joints, treatment of construction joints, expansion joints in buildings - their importance and location | | |  |  |
| 14. | 1. | | 8.11Defects in concrete: Identification of defects and methods of removing defects | | | 14. | Tests for Compressive strength of concrete cubes. |
|  | 2. | | 9.Importance and methods of non-destructive tests (introduction only)  9.1. Rebound Hammer Test  9.2. Pulse Velocity method | | |  |  |
|  | 3. | | Revision | | |  |  |
| 15. | 1 | | Assignment | | | 15. | To determine flexural strength of Concrete beam. |
|  | 2 | | Third Sessional | | |  |  |
|  | 3 | | Full Syllabus Test | | |  |  |

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| **Name of the Faculty** | | | | **:** | DHEERAJ SAHNI |  |  |
| **Discipline** | |  |  | **:** | **Civil Engg.** |  |  |
| **Semester** | |  |  | **:** | **4th Sem.** |  |  |
| **Subject** | |  |  | **:** | **Surveying** |  |  |
| **Lesson Plan Duration** | | | | **:** | **15 weeks** |  |  |
|  |  |  |  |  |  |  |  |
| **Week** |  | **Theory** |  |  |  | **Practical** |  |
|  |  | **Lecture** | **Topic (including assignment / test)** | | | **Practical** | **Topic** |
|  |  | **Day** |  |  |  | **Day** |  |
| 1. |  | 1. | 1Contouring | | Concept of contours, purpose of contouring, contour interval and horizontal equivalent |  | Preparing a Contour plan by radial line method |
|  |  | 2. | factors effecting contour interval, characteristics of contours, methods of contouring: Direct and indirect, use of stadia measurements in contour survey | | |  | -do- |
| 2. |  | 1. | interpolation of contours; use of contour map, Drawing cross section from a contour map; marking alignment of a road, railway and a canal on a contour map | | |  | Preparing a Contour plan by method of squares |
|  |  |  |  |  |
|  |  | 2. | computation of earth work and reservoir capacity from a contour map | | |  | -do- |
|  |  |  |  | | |  |  |
| 3. |  | 1. | 2. Theodolite Surveying: Working of a transit vernier theodolite, axes of a theodolite and their relation; temporary adjustments of a transit theodolite; concept of transiting, swinging, face left, face right and changing face | | |  | Preparing a contour plan of |
|  |  |  |  | | |  | Road/Railway track/canal by taking cross sections. |
|  |  | 2. | Measurement of horizontal and vertical angles. Prolonging a line (forward and backward) measurement of bearing of a line | | |  | -do- |
| 4. |  | 1. | traversing by included angles and deflection angle method; traversing by stadia measurement, theodolite triangulation, plotting a traverse | | |  | Basic about a theodolite |
|  |  | 2. | concept of coordinate and solution of omitted measurements (one side affected), errors in theodolite survey and precautions taken to minimize them; | | |  | Study of a transit vernier theodolite,Temp. adjustment of a  Theodolite |
| 5. |  | 1. | Limits of precision in theodolite traversing. Height of objects – accessible and non-accessible bases  3.Tacho-metric surveying: Tachometry, Instruments to be used in tachometry, methods of tachometry Assignment | | |  | Reading of a vernier and working out least count, measurement of horizontal angles by repetition and reiteration methods. |
|  |  | 2. | First Sessional | | |  | Measurement of vertical angles |
| 6. |  | 1. | Stadia system of tachometry, general principles of stadia tachometry, examples of stadia tachometry and Numerical problems. | | |  | Measurement of magnetic bearing  of a line |
|  |  |  |  |
|  |  | 2. | DO | | |  | Running a closed traverse with a |
|  |  |  |  |  |  |  | theodolite |
| 7. |  | 1. | 4 Curves: 4.1 Simple Circular Curve:  \*Need and definition of a simple circular curve; Elements of simple circular curve - Degree of the curve, radius of the curve, tangent length, point of intersection (Apex point), tangent point | | |  | -DO- |
|  |  | 2. | length of curve, long chord deflection angle, Apex distance and Mid-ordinate. Setting out of simple circular curve: | | |  | To find the height of objects with and without accessible bases. |
|  |  |  |  |  |  |  |  |
| 8. |  | 1. | a) By linear measurements only:  - Offsets from the tangent  - Successive bisection of arcs  - Offsets from the chord produced | | |  | Revision practice of theodolite |
|  |  | 2. | b)By tangential angles using a theodolite | | |  | -DO- |
| 9. |  | 1. | 4.2 Transition Curve:  Need (centrifugal force and super elevation) and definition of transition curve; requirements of transition curve; | | |  | Viva-voce |
|  |  | 2. | Assignment | | II |  |  |
| 10. |  | 1. | Second Sessional | | |  | Setting out simple circular curve |
|  |  |  |  |  |  |  | with offsets from the chords |
|  |  |  |  |  |  |  | produced |
|  |  | 2. | length of transition curve for roads; by cubic parabola; calculation of offsets for a transition curve; | | |  | -do- |
| 11. |  | 1. | setting out of a transition curve by tangential offsets only | | |  | Setting out simple circular curve  with [a] offsets from chord produced [b] one theodolite |
|  |  |  |  | | |  |
|  |  | 2. | 4.3 Vertical curve  Setting out of a vertical curve | | |  | -DO- |
| 12. |  | 1. | 5.Introduction to the use of Modern Surveying equipment and techniques such as:  a] EDM or Distomat | | |  | Use of minor instruments |
|  |  |  |  | | |  |  |
|  |  | 2. | b]Planimeter (Digital)  c]Total station  d]Introduction to remote sensing and GPS | | |  | Use of minor instruments |
| 13. |  | 1. | e] Auto level f]Digital theodolite | | |  | Use of minor instruments |
|  |  | 2. | Revision | | |  | Demonstration of digital |
|  |  |  |  |  |  |  | instruments |
| 14. | 1. | | DO | | |  | To plot the area with the help of Total Station |
|  | 2. | | Assignment III | | |  | Field Visit |
| 15. | 1. | | Third Sessional | | |  | Viva-voce and practice |
|  | 2. | | Full Syllabus Test | | |  | Viva-voce and practice |

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| **Name of the Faculty** | | | | **:** | M.P.SINGH |  |  |
| **Discipline** | |  |  | **:** | **Civil Engg.** |  |  |
| **Semester** | |  |  | **:** | **4th Sem.** |  |  |
| **Subject** | |  |  | : | **Public Health and Irrigation Engg Drawing** |  |  |
| **Lesson Plan Duration** | | | | **:** | **15 weeks** |  |  |
|  |  |  |  |  |  |  |  |
| **Week** |  | **Theory** | |  |  | **Practical** |  |
|  |  | **Lecture** | **Topic (including assignment / test)** | | | **Practical** | **Topic** |
|  |  | **Day** |  |  |  | **Day** |  |
| 1. |  |  |  |  |  | 1. | X-section of Standard types of open drains. |
|  |  |  |  |  |  | 2. | X-section of earthenware and RCC |
|  |  |  |  |  |  |  | Sewer pipes. |
| 2. |  |  |  |  |  | 3. | X-section of masonry sewers[Circular and Egg shaped] |
|  |  |  |  |  |  | 4. | Detailed section of floor trap , gully trap |
| 3. |  |  |  |  |  | 5. | Detailed plan and section of an inspection chamber. |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | 6. | Detailed plan and section of a manhole |
| 4. |  |  |  |  |  | 7. | Detailed plan &X-section of a |
|  |  |  |  |  |  |  | Domestic septic tank with soak pit for 5-10 users |
|  |  |  |  |  |  | 8. | DO |
|  |  |  |  |  |  |  |  |
| 5. |  |  |  |  |  | 9. | X-section through the external wall |
|  |  |  |  |  |  |  | of lavatories at Ground and First Floor. |
|  |  |  |  |  |  | 10. | First Sessional |
| 6. |  |  |  |  |  | 11. | Plan of a bathroom showing positions of various fittings. |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | 12. | Draw Sectional elevation of a two  storey building showing details of  one pipe system and two pipe  system |
| 7. |  |  |  |  |  | 13. | DO |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  | 14. | Revision |
| 8. |  |  |  |  |  | 15. | Revision |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | 16. | Reading of working drawings |
| 9. |  |  |  |  |  | 17. | Reading of working drawings |
|  |  |  |  |  |  | 18. | L-section of a channel |
| 10. |  |  |  |  |  | 19. | Typical X-sections of various canal |
|  |  |  |  |  |  |  | sections |
|  |  |  |  |  |  | 20. | Second Sessional |
| 11. |  |  |  |  |  | 21. | Plan of a canal head works |
|  |  |  |  |  |  | 22. | Typical L-section of a weir |
| 12. |  |  |  |  |  | 23. | X-section of an earthen dam |
|  |  |  |  |  |  | 24. | -do- |
| 13. |  |  |  |  |  | 25. | X-section of a tube-well |
|  |  |  |  |  |  | 26. | -do- |
| 14. |  |  |  |  |  | 27. | Layout and X-section of rain water harvesting System |
|  | |  | | | 28. | Third Sessional |
| 15. |  | |  | | | 29. | Revision |
|  |  | |  | | | 30. | Viva-voce |

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| **Name of the Faculty** | | | | **:** |  |  |  |
| **Discipline** | |  |  | **:** | **Civil Engg.** |  |  |
| **Semester** | |  |  | **:** | **4th Sem.** |  |  |
| **Subject** | |  |  | **:** | **Structural Mechanics** |  |  |
| **Lesson Plan Duration** | | | | **:** | **15 weeks** |  |  |
|  |  |  |  |  |  |  |  |
| **Week** |  | **Theory** |  |  |  | **Practical** |  |
|  |  | **Lecture** | **Topic (including assignment / test)** | | | **Practical** | **Topic** |
|  |  | **Day** |  |  |  | **Day** |  |
| 1. |  | 1 | 1. Properties of Materials  1.1 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. | 2. Simple Stresses and Strains 2.1 Concept of stress, normal and shear stresses | | |  |  |
| 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. | | |  |  |
| 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. |  | 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). | | |  |  |
| 5. |  | 1. | 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. | iii)Determination of Young's modulus of elasticity for steel wire with searl's apparatus |
|  |  | 2. | Assignment | | |  |  |
|  |  | 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 | | |  |  |
| 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 | | |  |  |
|  |  |  |  | |  |  |  |
| 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. | 5.Bending Stresses in Beams: 5.1 Concept of pure/simple bending | | |  |  |
| 9. |  | 1. | 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. | 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. | 6.Shear Stresses in Beams  6.1Concept of shear stresses in beams, | | |  |  |
| 10. |  | 1. | shear stress distribution in rectangular, circular I, T, L sections for S.S. beams and Portland | | | 10. | DO |
|  |  | 2. | Assignment II | | |  |  |
|  |  | 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 | | 9.Analysis of Trusses:  9.1Concept of a perfect, redundant and deficient frames | | |  |  |
| 13. | 1. | | 9.2  Assumptions and analysis of trusses by:  a) Method of joints | | | 13. | DO |
|  | 2. | | b)Method of sections | | |  |  |
|  | 3. | | DO | | |  |  |
| 14. | 1. | | Assignment III | | | 14. | DO |
|  | 2. | | Revision | | |  |  |
|  | 3. | | Third Sessional | | |  |  |
| 15. | 1. | | Revision | | | 15. |  |
|  | 2. | | DO | | |  | Revision |
|  | 3. | | Full Syllabus Test | | |  |  |

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| **Name of the Faculty** | | | | **:** | Rakesh Kumar |
| **Discipline** | |  |  | **:** | **Civil Engg.** |
| **Semester** | |  |  | **:** | **4th Sem.** |
| **Subject** | |  |  | **:** | **Reinforced Concrete Design** |
| **Lesson Plan Duration** | | | | **:** | **15 weeks** |
|  |  |  |  |  |  |
| **Week** |  | **Theory** |  |  |  |
|  |  | **Lecture** | **Topic (including assignment / test)** | | |
|  |  | **Day** |  |  |  |
| 1. |  | 1 | 1.Introduction  1.1Concept of Reinforced Cement Concrete (RCC)  1.2 Reinforcement Materials:  Suitability of steel as reinforcing material  Properties of mild steel and HYSD steel | | |
|  |  | 2. | 1.3.Loading on structures as per IS: 875 | | |
|  |  | 3. | 2.Introduction to following methods of RCC design  2.1 Working stress method: Definition and basic assumptions | | |
| 2. |  | 1. | 2.2 Limit state method: Definition and basic assumptions | | |
|  |  | 2. | 3.Shear and Development Length Shear as per IS:456-2000 by working stress method i)Shear strength of concrete without shear reinforcement | | |
|  |  | 3. | ii)Maximum shear stress  iii]Shear reinforcement | | |
| 3. |  | 1. | 4.Concept of Limit State Method 4.1.Definitions and assumptions made in limit state of collapse (flexure) | | |
|  |  | 2. | 4.2. Partial factor of safety for materials  4.3. Partial factor of safety for loads | | |
|  |  | 3. | 4.4. Design loads  4.5. Stress block, parameters | | |
| 4. |  | 1. | 5.Singly Reinforced beam : Theory and design of singly reinforced beam by Limit State Method | | |
|  |  | 2. | DO | |  |
|  |  | 3. | DO | | |
| 5. |  | 1. | DO | | |
|  |  | 2. | DO | |  |
|  |  | 3. | DO | | |
| 6. |  | 1. | First Sessional | | |
|  |  | 2. | 6.Doubly Reinforced Beams: Theory and design of simply supported doubly reinforced rectangular beam by Limit State Method | | |
|  |  | 3. | DO | | |
| 7. |  | 1. | DO | | |
|  |  | 2. | DO | | |
|  |  | 3. | DO | | |
|  |  |  |  | |  |
| 8. |  | 1. | DO | | |
|  |  | 2. | DO | | |
|  |  | 3. | 7. Behaviour of T beam, inverted T beam, isolated T beam and ‘L’ beams (No  Numericals) | | |
| 9. |  | 1. | 8. One Way Slab:Theory and design of simply supported one way slab including sketches showing reinforcement details (plan and section) by Limit State Method.. | | |
|  |  | 2. | DO | | |
|  |  | 3. | DO | | |
| 10. |  | 1. | DO | | |
|  |  | 2. | DO | | |
|  |  | 3. | DO | | |
| 11. |  | 1. | Second Sessional | | |
|  |  | 2. | 9.Two Way Slab: Theory and design of two-way simply supported slab with corners free to lift, no provisions for torsional reinforcement by Limit State Method including sketches showing reinforcement details (plan and two sections) | | |
|  |  |  |
|  |  | 3. | DO | | |
|  |  |  |  | | |
| 12. |  | 1. | DO | | |
|  |  | 2. | DO | | |
|  | 3 | | DO | | |
| 13. | 1. | | 10.Axially Loaded Column 10.1 Definition and classification of columns  10.2. Effective length of column,  10.3. Specifications for longitudinal and lateral reinforcement | | |
|  | 2. | | DO | | |
|  | 3. | | 10.4.Design of axially loaded square, rectangular and circular short columns by Limit State Method including sketching of reinforcement(sectional elevation and plan) | | |
| 14. | 1. | | DO | | |
|  | 2. | | 11Pre-stressed Concrete  11.1 Concept of pre-stressed concrete  11.2 Methods of pre-stressing : pre-tensioning and post-tensioning | | |
|  | 3. | | 11.3 Advantages and disadvantages of pre-stressing  11.4 Losses in pre-stress | | |
| 15. | 1. | | Revision | | |
|  | 2. | | Third Sessional | | |
|  | 3. | | Full Syllabus Test | | |

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| **Name of the Faculty** | | | | **:** |  |
| **Discipline** | |  |  | **:** | **Civil Engg.** |
| **Semester** | |  |  | **:** | **4th Sem.** |
| **Subject** | |  |  | **:** | **Irrigation Engineering** |
| **Lesson Plan Duration** | | | | **:** | **15 weeks** |
|  |  |  |  |  |  |
| **Week** |  | **Theory** |  |  |  |
|  |  | **Lecture** | **Topic (including assignment / test)** | | |
|  |  | **Day** |  |  |  |
| 1. |  | 1 | 1. Introduction:  1.1 Definition of irrigation  1.2 Necessity of irrigation | | |
|  |  | 2. | 1.3 History of development of irrigation in India  1.4 Major, medium and minor irrigation projects | | |
|  |  | 3. | 2. Water Requirement of Crops  2.1 Principal crops in India and their water requirements  2.2 Crop seasons – Kharif and Rabi | | |
| 2. |  | 1. | 2.3 Soil water, soil crop and crop water relationships, Duty, Delta and Base Period, their relationship | | |
|  |  | 2. | 2.4 Gross commanded area (GCA), culturable commanded area (CCA), Intensity of Irrigation, Irrigable area | | |
|  |  | 3. | 3. Hydrological Cycle Catchment Area and Run-off  Rainfall , definition rain-gauges – automatic and non-automatic, | | |
| 3. |  | 1. | methods of estimating average rainfall (Arithmatic system) | | |
|  |  | 2. | catchment area runoff, factors affecting runoff, hydrograph, basic concept of unit hydrograph. | | |
|  |  | 3. | 4.Methods of Irrigation  4.1 Flow irrigation - its advantages and limitations | | |
| 4. |  | 1. | 4.2 Lift Irrigation – Tubewell, submersible and well irrigation advantages and disadvantages | | |
|  |  | 2. | 4.3 Drip irrigation, suitability of drip irrigation, layout, component parts, advantages | | |
|  |  | 3. | 5.Canals 5.1 Classification, appurtenances of a canal and their functions, sketches of different canal cross-sections | | |
| 5. |  | 1. | 5.2 Various types of canal lining - their related advantages and disadvantages, sketches of different lined canal x-sections | | |
|  |  | 2. | 5.3 Breaches and their control | | |
|  |  | 3. | 5.4 Maintenance of lined and unlined canals | | |
| 6. |  | 1. | Assignment | | |
|  |  | 2. | First Sessional | | |
|  |  | 3. | 6. Tube Well Irrigation: 6.1Introduction, occurrence of ground water, location and command, advantages and disadvantages, comparison with canal irrigation | | |
| 7. |  | 1. | 6.2 Tube wells, explanation of terms: water table, radius of influence, depression head, cone of depression, confined and unconfined aquifers. Yield of a well and methods of determining yield of well | | |
|  |  | 2. | 6.3 Types of tube wells and their choice-cavity, strainer and slotted type; | | |
|  |  | 3. | 6.4Method of boring, installation of well assembly, development of well, pump selection and installation and maintenance | | |
|  |  |  |  | |  |
| 8. |  | 1. | 6.5Water Harvesting Techniques: Need and requirement of various methods, Run-off from roof top and ground surface, construction of recharge pits and recharge wells and their maintenance. | | |
|  |  | 2. | 7. Dams7.1 Classification of dams; earth dams - types, causes of failure; cross-section of zoned earth dam, method of construction, gravity dams – types, cross-sections of a dam, method of construction | | |
|  |  | 3. | 7.2 Concept of small and micro dams | | |
| 9. |  | 1. | 7.3 Concept of spillways and energy dissipators | | |
|  |  | 2. | 8. Canal Head Works and Regulatory Works Definition, object, general layout, functions of different parts of head works. | | |
|  |  | 3. | Difference between weir and barrage | | |
| 10. |  | 1. | 9 Cross Drainage Works 9.1 Functions and necessity of the following types: aqueduct, super passage, level crossing, inlet and outlet | | |
|  |  | 2. | 9.2 Sketches of the above cross drainage works | | |
|  |  | 3. | Assignment II | | |
| 11. |  | 1. | Second Sessional | | |
|  |  | 2. | 10 Definitions of following Hydraulic Structures with Sketches10.1 Falls10.2 Cross and head regulators | | |
|  |  |  |  | | |
|  |  | 3. | 10.3 Outlets 10.4 Canal Escapes | | |
|  |  |  |  | | |
| 12. |  | 1. | 11. River Training Works  Methods of river training, guide banks, retired (levees) embankments | | |
|  |  | 2. | groynes and spurs, pitched island, cut-off | | |
|  | 3 | | 12. Water Logging and Drainage and Ground Water Re-charge  12.1Definition of water logging – its causes and effects, detection, | | |
| 13. | 1. | | prevention and remedies | | |
|  | 2. | | 12.2 Surface and sub-surface drains and their layout | | |
|  | 3. | | 12.3 Concept and various techniques used for ground water re-charge | | |
| 14. | 1. | | Assignment III | | |
|  | 2. | | Third Sessional | | |
|  | 3. | | Revision | | |
| 15. | 1. | | DO | | |
|  | 2. | | DO | | |
|  | 3. | | Full Syllabus Test | | |

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| **Name of the Faculty** | | | | **:** |  |  |  |
| **Discipline** | |  |  | **:** | **Civil Engg.** |  |  |
| **Semester** | |  |  | **:** | **4th Sem.** |  |  |
| **Subject** | |  |  | **:** | **Public Health Engg** |  |  |
| **Lesson Plan Duration** | | | | **:** | **15 weeks** |  |  |
|  |  |  |  |  |  |  |  |
| **Week** |  | **Theory** |  |  |  | **Practical** |  |
|  |  | **Lecture** | **Topic (including assignment / test)** | | | **Practical** | **Topic** |
|  |  | **Day** |  |  |  | **Day** |  |
| 1. |  | 1 | 1.Introduction  1.1Necessity and brief description of water supply system.  1.2 Sources of water – surface/sub-surface sources | | | 1. | 1) To determine turbidity of water sample |
|  |  | 2. | 2 Quantity of Water 2.1 Water requirement | | |  |  |
|  |  | 3. | 2.2 Rate of demand and variation in rate of demand | | |  |  |
| 2. |  | 1. | 2.3 Per capita consumption for domestic, industrial, public and fire fighting uses as per BIS standards (no numerical problems) | | | 2. | 2) To determine dissolved oxygen of given sample |
|  |  | 2. | 2.4 Population Forecasting | | |  |  |
|  |  | 3. | 3. Quality of Water 3.1 Meaning of pure water and methods of analysis of water | | |  |  |
| 3. |  | 1. | 3.2 Physical, Chemical and bacteriological tests and their significance | | | 3. | 3) To determine pH value of water |
|  |  | 2. | 3.3 Standard of potable water as per Indian Standard | | |  |  |
|  |  | 3. | 3.4 Maintenance of purity of water | | |  |  |
| 4. |  | 1. | 4. Water Treatment (brief introduction) 4.1 Sedimentation - purpose, types of sedimentation tanks | | | 4. | 4) To perform jar test for coagulation |
|  |  | 2. | 4.2 Coagulation/floculation - usual coagulation and their feeding | |  |  |  |
|  |  | 3. | 4.3 Filtration - significance, types of filters, their suitability | | |  |  |
| 5. |  | 1. | 4.4 Necessity of disinfection of water, forms of chlorination, break point chlorine, residual chlorine, application of chlorine. | | | 5. | 5)To determine BOD of given sample |
|  |  | 2. | 4.5 Flow diagram of different treatment units, functions of (i) Areation fountain (ii) mixer (iii) floculator, (iv) classifier, (v) slow and rapid sand filters (vi) chlorination chamber. | |  |  |  |
|  |  | 3. | Assignment I | | |  |  |
| 6. |  | 1. | First Sessional | |  | 6. | 6) To determine residual chlorine in water |
|  |  | 2. | 5. Conveyance of Water  5.1 Different types of pipes - cast iron, PVC, steel, asbestos cement, concrete and lead pipes. Their suitability and uses, types of joints in different types of pipes. | | |  |  |
|  |  | 3. | 5.2 Appurtenances: Sluice, air, reflux valves, relief  valves, scour valves, bib cocks, stop cocks, | | |  |  |
| 7. |  | 1. | fire hydrants, water meters their working and uses | | | 7. | 7) To determine conductivity of water and total dissolved solids |
|  |  | 2 | 6. Laying of Pipes 6.1 Setting out alignment of pipes  6.2 Excavation for laying of pipes and precautions to be taken | | |  |  |
|  |  | 3. | 6.3 Handling, lowering and jointing of pipes  6.4 Testing of pipe lines | | |  |  |
|  |  |  |  | |  |  |  |
| 8. |  | 1. | 6.5 Back filling  7.Building Water Supply  7.1 Connections to water main (practical aspect only) | | | 8. | 8) To study the installation of following:  a) Water meter  b) Connection of water supply of building with main |
|  |  | 2. | 7.2 Water supply fittings (with sketches) and terminology related to plumbing | | |  |  |
|  |  | 3. | **B. WASTE WATER ENGINEERING** 8.Introduction  8.1Purpose of sanitation  8.2 Necessity of systematic collection and disposal of waste | | |  |  |
| 9. |  | 1. | 8.3 Definition of terms in sanitary engineering  8.4 Collection and conveyance of sewage | | | 9. | c) Pipe valves and bends  d) Water supply and sanitary fittings |
|  |  | 2. | 8.5 Conservancy and water carriage systems, their advantages and Disadvantages  8.6 (a) Surface drains (only sketches) : various types, suitability  (b) Types of sewage: Domestic, industrial, storm water and its seasonal       variation | | |  |  |
|  |  | 3. | 9. Sewerage System  9.1 Types of sewerage systems, materials for sewers, their sizes and joints  9.2 Appurtenance: Location, function and construction features. Manholes, | | |  |  |
| 10. |  | 1. | drop manholes, tank hole, catch basin, inverted siphon, flushing tanks grease and oil traps, storm regulators, ventilating shafts | | | 10. | 9) To study and demonstrate the joining/tPeriodseading of GI Pipes, CI Pipes, SWG pipes, PVC pipes and copper pipes. |
|  |  | 2. | 10. Laying and Construction of Sewers: 10.1Setting out/alignment of sewers  10.2 Excavations, checking the gradient with boning rods preparation of bedding, handling and jointing testing and back filling of sewers/pipes. | | |  |  |
|  |  | 3. | 10.3 Construction of surface drains and different sections required | | |  |  |
| 11. |  | 1. | Assignment II | | | 11. | 10) To demonstrate the laying of SWG pipes for sewers |
|  |  | 2. | Second Sessional | | |  |
|  |  |  |  | | |  |  |
|  |  | 3. | 11Sewage Characteristics:  11.1Properties of sewage and IS standards for analysis  of sewage | | |  |  |
|  |  |  |  | | |  |  |
| 12. |  | 1. | 11.2 Physical, chemical and bacteriological parameters | | | 12 | 11)Study of water purifying process by visiting a field lab |
|  | 2. | 12. Natural Methods of Sewerage Disposal  12.1 General composition of sewage and disposal methods  12.2 Disposal by dilution | | |
| 3 | | 12.3 Self purification of stream  12.4 Disposal by land treatment  12.5 Nuisance due to disposal | | |
| 13. | 1. | | 13. Sewage Treatment  13.1 Meaning and principle of primary and secondary treatment and activated sludge process their flow diagrams | | | 13. | 12) Demonstration of plumbing tools |
|  | 2. | | 13.2 Introduction and uses of screens, grit chambers, detritus tanks, skimming tanks, plainsedimentation tanks, primary clarifers, secondary clarifers, filters, control beds | | |  |  |
|  | 3. | | intermittent sand filters, trickling filters, sludge treatment and disposal, oxidation ponds (Visit to a sewage treatment plant) | | |  |  |
| 14. | 1. | | 14. Building Drainage  14.1 Aims of building drainage and its requirements | | | 14. |  |
|  | 2. | | 14.2 Different sanitary fittings and installations  14.3 Traps | | |  |  |
|  | 3. | | Assignment III | | |  |  |
| 15. | 1 | | Third Sessional | | | 15. |  |
|  | 2 | | Revision | | |  |  |
|  | 3 | | Full Syllabus | | |  |  |