## Lesson Plan (Even Semester)

#### Name of the Faculty : Naveen Sheoran

#### Discipline : Civil Engg.

**Semester :** 4th

**Subject :** WATER SUPPLY & WASTE WATER ENGG.

**Lesson Plan Duration :** 15 weeks

##### \*\*Work load (Lecture / Practical) per week(in hours): Lectures-04, practicals -02

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| **Week** | **Theory** | | **Practical** | |
| **Lecture day** | **Topic**  **(Including assignment / test)** | **Practical Day** | **Topic** |
| 1st | 1st | **A. WATER SUPPLY Chapter 1st: Introduction** | 1st | To determine turbidity of water sample |
| 2nd | **Chapter 2nd: Quantity of Water**  Water requirement, Rate of demand and variation in rate of demand |
| 3rd | Per capita consumption for domestic,  industrial, public and fire fighting uses as per BIS standards |
| 4th | Population Forecasting |
| 5th | **Chapter 3rd: Quality of Water**  Meaning of pure water and methods of analysis of water |
| 2nd | 6th | Physical, Chemical and bacteriological  tests and their significance | 2nd | To determine dissolved oxygen of given sample |
| 7th | Standard of potable water as per Indian  Standard |
| 6th | Maintenance of purity of water (small  scale and large scale quantity) |
| 9th | **Revision** |
| 10th | **Chapter 4th: Water Teatment**  Sedimentation - purpose, types of sedimentation tanks |
| 3rd | 11th | Coagulation floculation - usual  coagulation and their feeding | 3rd | To determine pH value of water |
| 12th | Filtration - significance, types of filters,  their suitability |
| 13th | Necessity of disinfection of water, forms  of chlorination, break point chlorine, residual chlorine, application of chlorine. |

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|  | 14th | 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. |  |  |
| 15th | **Revision Assignment No 1** |
| 4th | 16th | **Sessional Test 1** | 4th | To perform jar test for coagulation |
| 17th | **Chapter 5th Conveyance of Water**  Different types of pipes - cast iron, PVC,  steel, asbestos cement, concrete and lead pipes. Their suitability and uses |
| 18th | Types of joints in different types of pipes, Appurtenances: Sluice, air, reflux valves, relief valves, scour valves, bib  cocks |
| 19th | Distribution site: Requirement of  distribution, minimum head and rate, methods of layout of distribution pipes |
| 20th | Systems of water supply - Intermittent  and continuous service reservoirs - types, necessity and accessories. |
| 5th | 21st | Wastage of water - preventive measures,  Maintenance of distribution system | 5th | To determine BOD of given sample |
| 22nd | Leakage detection in deatil |
| 23rd | **Chapter 6th: Laying out Pipe**  Setting out alignment of pipes |
| 24th | Excavation for laying of pipes and precautions to be taken in laying pipes in  black cotton soil. |
| 25th | Testing of pipe lines,Back filling and use  of boring rods |
| 6th | 26th | **Chapter7th. Building Water Supply**  Connections to water main (practical  aspect only) | 6th | To determine residual chlorine in water |
| 27th | Water supply fixtures and installations  and terminology related to plumbing |
| 28th | **Revision** |
| 29th | **B. Waste Water Engineering Chapter8. Introduction**  Purpose of sanitation |
| 30th | Necessity of systematic collection and  disposal of waste |

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| 7th | 31st | Definition of terms in sanitary  engineering, Collection and conveyance of sewage | 7th | To determine conductivity of water and total dissolved solids |
| 32nd | Conservancy and water carriage systems, their advantages and Disadvantages |
| 33rd | Surface drains (only sketches) : various  types, suitability |
| 34th | Types of sewage: Domestic, industrial,  storm water and its seasonal variation |
| 35th | **Chapter9th: Sewerage System**  Types of sewerage systems |
| 8th | 36th | Appurtenance: Location, function and  construction features. | 8th | To study the installation of Water meter |
| 37th | Manholes, drop manholes, tank hole,  catch basin, |
| 38th | Inverted siphon, flushing tanks grease  and oil traps, storm |
| 39th | **Chapter10th. Laying and Construction of Sewers**  Setting out/alignment of sewers |
| 40th | Excavations, checking the gradient with boning rods preparation of bedding, handling and jointing testing and back  filling of sewers/pipes. |
| 9th | 41st | Construction of surface mains and  different sections required | 9th | To study the installation of Connection of water supply of building with main |
| 42nd | **Revision**  **Assignment No 2**   1. **,** function and construction features. Manholes, drop manholes, tank hole, catch basin, inverted siphon, 2. Water supply fixtures and installations   and terminology |
| 43rd | **Sessional Test 2** |
| 44th | **Chapter 11th Sewage characteristics:**  Properties of sewage |
| 45th | **Revision** |
| 10th | 46th | **Chapter 12th. Natural Methods of**  **Sewerage Disposal** | 10th | To study the installation of Pipe valves and bends and Water supply and sanitary fittings |
| 47th | Disposal methods |
| 48th | Disposal by dilution |
| 49th | Disposal by land treatment |
| 50th | Nuisance due to disposal |

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| 11th | 51st | **Revision** | 11th | To study and demonstrate the joining/threading of GI Pipes, CI Pipes, SW pipes, D.I. pipes and PVC pipes. |
| 52nd | **Chapter 13th. Sewage Treatment**  Meaning and principle of primary and secondary treatment |
| 53rd | Activated sludge process their flow  diagrams |
| 54th | Introduction and uses of screens, grit  chambers |
| 55th | Detritus tanks |
| 12th | 56th | Skimming tanks | 12th | To demonstrate the laying of SW pipes for sewers |
| 57th | Plainsedimentation tanks |
| 58th | Primary clarifers |
| 59th | Secondary clarifers |
| 60th | Filters |
| 13th | 61st | Control beds | 13th | Study of water purifying process by visiting a field lab. |
| 62nd | Intermittent sand filters |
| 63rd | Trickling filters |
| 64th | Sludge treatment and disposal |
| 65th | Oxidation ponds |
| 14th | 66th | **Revision** | 14th | To test house drainage |
| 67th | **Chapter 14th. Building Drainage**  Aims of building drainage |
| 68th | Building drainage requirements |
| 69th | Different sanitary fittings |
| 70th | Sanitary fittings installations |
| 15th | 71st | Traps, seals | 15th | **Revision** |
| 72nd | Causes of breaking seals |
| 73rd | **Revision Assignment No 3**   1. Disposal methods 2. Filters |
| 74th | **Revision** |
| 75th | **Sessional Test No. 3** |