

## LESSON PLAN

| <b>Discipline: Civil Engineering</b>  |      | <b>Name of The Teaching Faculty: Jyotirmayee Samal</b> |                 |  |                           |
|---|------|--|-----------------|--|---------------------------|
| <b>Subject: WATER SUPPLY&amp; WASTE WATER ENGINEERING(TH.4)</b>                                       |      | <b>Semester From Date:1-08-2023 To Date 30-11-2023</b> |                 |  |                           |
| <b>SEMESTER-5th (WINTER 2023)</b>   |      | <b>No. Of Weeks:19</b>                                 |                 | <b>5P/WEEK</b>   |                           |
| <b>No. of Days/week class allotted: 05 period per week (Mon,Tues,Wed,Thu &amp; Sat 1 Period each)</b> |      |  |                 |  | <b>TOTAL PERIOD-75</b>    |
| MONTH   | WEEK | DATE   | DAYS/P<br>ERIOD | SYLLABUS TO BE COVERED   | NOS. OF PERIODS AVAILABLE |
| <b>SECTION A: WATER SUPPLY</b>  |      |  |                 |  |                           |
| <b>Aug</b>  |      |  |                 | <b>1. Introduction to Water Supply, Quantity and Quality of water(10P)</b>                                   | <b>10</b>                 |
|   | 1st  | 1.08.2023  | Tues            | 1.1 Necessity of treated water supply  | 1                         |
|   |      | 2.08.2023  | Wed             | 1.2 Per capita demand, variation in demand and factors affecting demand                                      | 1                         |
|   |      | 3.08.2023  | Thurs           | 1.2 Per capita demand, variation in demand and factors affecting demand                                      | 1                         |
|   |      | 5.08.2023  | Sat             | 1.3 Methods of forecasting population, Numerical problems using different methods                            | 1                         |
|   | 2nd  | 7.08.2023  | Mon             | 1.3 Methods of forecasting population, Numerical problems using different methods                            | 1                         |
|   |      | 8.08.2023  | Tues            | 1.3 Methods of forecasting population, Numerical problems using different methods                            | 1                         |
|   |      | 9.08.2023  | Wed             | 1.4 Impurities in water – organic and inorganic, Harmful effects of impurities                               | 1                         |
|   |      | 10.08.2023   | Thurs           | 1.5 Analysis of water –physical, chemical and bacteriological  | 1                         |
|   |      | 12.08.2023   | Sat             | 1.5 Analysis of water –physical, chemical and bacteriological  | 1                         |
|   | 3rd  | 14.08.2023   | Mon             | 1.6 Water quality standards for different uses   | 1                         |
|   |      |  |                 | <b>2. Sources and Conveyance of water(8P)</b>  | <b>8</b>                  |
|   |      | 16.08.2023   | Wed             | 2.1 Surface sources – Lake, stream, river and impounded reservoir  | 1                         |
|   |      | 17.08.2023   | Thurs           | 2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well | 1                         |
|   |      | 19.08.2023   | Sat             | 2.3 Yield from well- methods of determination, Numerical problems using yield formulae ( deduction excluded) | 1                         |

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| 4th | 21.08.2023 | Mon        | 2.3 Yield from well- methods of determination, Numerical problems using yield formulae ( deduction excluded)                        | 1  |   |
|     | 22.08.2023 | Tues       | 2.4 Intakes – types, description of river intake, reservoir intake, canal intake  | 1  |   |
|     | 23.08.2023 | Wed        | 2.5 Pumps for conveyance & distribution – types, selection, installation.   | 1  |   |
|     | 24.08.2023 | Thurs      | 2.6 Pipe materials – necessity, suitability, merits & demerits of each type   | 1  |   |
|     | 26.08.2023 | Sat        | 2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method Laying of pipes – method    | 1  |   |
|     |            |            | <b>3. Treatment of water (12P)</b>  | <b>12</b>  |   |
|     | 5th        | 28.08.2023 | Mon   | 3.1 Flow diagram of conventional water treatment system  | 1 |
|     |            | 29.08.2023 | Tues  | 3.2 Treatment process / units :  |   |
|     |            | 31.08.2023 | Thurs   | 3.2.1 Aeration ; Necessity   | 1 |
| 1st | 2.09.2023  | Sat        | 3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance | 1  |   |
|     | 2nd        | 4.09.2023  | Mon   | 3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)   | 1 |
|     |            | 5.09.2023  | Tues  | 3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)   | 1 |
|     |            | 7.09.2023  | Thurs   | 3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features.   | 1 |
|     |            | 9.09.2023  | Sat   | 3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features.   | 1 |
|     | 3rd        | 11.09.2023 | Mon   | 3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super- chlorination | 1 |
|     |            | 12.09.2023 | Tues  | 3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super- chlorination | 1 |
|     |            | 13.09.2023 | Wed   | 3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)  | 1 |

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|     | 14.09.2023                                | Thurs | 3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)         | 1        |
|     |   |       | <b>4. Distribution system And Appurtenance in distribution system: (8P)</b>   | <b>8</b> |
|     | 16.09.2023                                | Sat   | 4.1 General requirements, types of distribution system-gravity, direct and combined   | 1        |
| 4th | 18.09.2023                                | Mon   | 4.1 General requirements, types of distribution system-gravity, direct and combined   | 1        |
|     | 21.09.2023                                | Thurs | 4.2 Methods of supply – intermittent and continuous   | 1        |
|     | 23.09.2023                                | Sat   | 4.2 Methods of supply – intermittent and continuous   | 1        |
| 5th | 25.09.2023                                | Mon   | 4.3 Distribution system layout – types, comparison, suitability   | 1        |
|     | 26.09.2023                                | Tues  | 4.3 Distribution system layout – types, comparison, suitability   | 1        |
|     | 27.09.2023                                | Wed   | 4.4 Valves-types, features, uses, purpose-slucice valves, check valves, air valves, scour valves, Fire hydrants, Water meters | 1        |
|     | 28.09.2023                                | Thurs | 4.4 Valves-types, features, uses, purpose-slucice valves, check valves, air valves, scour valves, Fire hydrants, Water meters | 1        |
|     |   |       | <b>5.W/s plumbing in building : (2P)</b>  | <b>2</b> |
|     | 30.09.2023                                | Sat   | 5.1 Method of connection from water mains to building supply  | 1        |
| 1st | 3.10.2023                                 | Tues  | 5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.    | 1        |
|     | <b>SECTION B: WASTE WATER ENGINEERING</b> |       |   |          |
|     |   |       | 6.Introduction(5P)  | <b>5</b> |
|     | 4.10.2023                                 | Wed   | 6.1 Aims and objectives of sanitary engineering   | 1        |
|     | 5.10.2023                                 | Thurs | 6.2 Definition of terms related to sanitary engineering   | 1        |
|     | 7.10.2023                                 | Sat   | 6.2 Definition of terms related to sanitary engineering   | 1        |
|     | 9.10.2023                                 | Mon   | 6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability                | 1        |
|     | 10.10.2023                                | Tues  | 6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability                | 1        |
|     |   |       | <b>7. Quantity and Quality of sewage (7P)</b>   | <b>7</b> |

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| Oct | 2nd        | 11.10.2023 | Wed  | 7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage. | 1        |
|     |            | 12.10.2023 | Thurs  | 7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage. | 1        |
|     |            | 14.10.2023 | Sat  | 7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring                              | 1        |
|     | 3rd        | 16.10.2023 | Mon  | 7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring                              | 1        |
|     |            | 17.10.2023 | Tues   | 7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological   | 1        |
|     |            | 18.10.2023 | Wed  | 7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD  | 1        |
|     |            | 19.10.2023 | Thurs  | 7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD  | 1        |
|     |            |            |  | <b>8. Sewerage system (5P)</b>  | <b>5</b> |
|     | 5th        | 30.10.2023 | Mon  | 8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability  | 1        |
|     |            | 31.10.2023 | Tues   | 8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability  | 1        |
| 1st | 1.11.2023  | Wed        | 8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability | 1   |          |
|     | 2.11.2023  | Thurs      | 8.3 Laying of sewer-setting out sewer alignment                          | 1   |          |
|     | 4. 11.2023 | Sat        | 8.3 Laying of sewer-setting out sewer alignment                          | 1   |          |
|     |            |            | <b>9. Sewer appurtenances and Sewage Disposal: (7P)</b>                  | <b>7</b>  |          |
| 2nd | 6.11.2023  | Mon        | 9.1 Manholes and Lamp holes – types, features, location, function        | 1   |          |
|     | 7.11.2023  | Tues       | 9.2 Inlets, Grease & oil trap – features, location, function             | 1   |          |
|     | 8.11.2023  | Wed        | 9.3 Storm regulator, inverted siphon – features, location, function      | 1   |          |

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| <b>Nov</b> |     | 9.11.2023  | Thurs      | 9.4 Disposal on land – sewage farming, sewage application and dosing,sewage sickness-causes and remedies | 1  |          |
|            |     | 11.11.2023 | Sat        | 9.4 Disposal on land – sewage farming, sewage application and dosing,sewage sickness-causes and remedies | 1  |          |
|            | 3rd |            | 13.11.2023 | Mon  | 9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream  | 1        |
|            |     |            | 14.11.2023 | Tues   | 9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream  | 1        |
|            |     |            |            |  | <b>10. Safety Management In Construction (8P)</b>  | <b>8</b> |
|            |     |            | 15.11.2023 | Wed  | 10.1 Principles of treatment, flow diagram of conventional treatment   | 1        |
|            |     |            | 16.11.2023 | Thurs  | 10.1 Principles of treatment, flow diagram of conventional treatment   | 1        |
|            |     |            | 18.11.2023 | Sat  | 10.2 Primary treatment – necessity, principles, essential features, functions  | 1        |
|            | 4th |            | 20.11.2023 | Mon  | 10.2 Primary treatment – necessity, principles, essential features, functions  | 1        |
|            |     |            | 21.11.2023 | Tues   | 10.2 Primary treatment – necessity, principles, essential features, functions  | 1        |
|            |     |            | 22.11.2023 | Wed  | 10.3 Secondary treatment – necessity, principles, essential features, functions  | 1        |
|            |     |            | 23.11.2023 | Thurs  | 10.3 Secondary treatment – necessity, principles, essential features, functions  | 1        |
|            |     |            | 25.11.2023 | Sat  | 10.3 Secondary treatment – necessity, principles, essential features, functions  | 1        |
|            |     |            |            |  | <b>11. Sanitary plumbing for building :(3P)</b>  | <b>3</b> |
|            | 5th |            | 28.11.2023 | Tues   | 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage  | 1        |
|            |     |            | 29.11.2023 | Wed  | 11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice   | 1        |
|            |     |            | 30.11.2023 | Thurs  | 11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe | <b>1</b> |