

LESSON PLAN FOR WINTER 2023

| Department: Civil Engineering | | Sem: 5TH Sec-B | | Name of the Teaching faculty: ARPITA ROUT | |
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| Subject :- Th4. WATER SUPPLY AND WASTE WATER ENGINEERING | | No. of Days/ week class allotted : 4 | | SEMESTER - 5TH SEM SEC B FROM DATE-1/08/2023 TO DATE- 30/11/2023 NO. OF WEEKS-18 WEEKS | |
| Week | Class Day | Topics | | Remarks | |
| | | 1. Introduction to Water Supply, Quantity and Quality of water (10P) | | | |
| 1st WEEK | 2 ND | 1.1 Necessity of treated water supply | | | |
| | 3 rd | 1.2 Per capita demand, variation in demand and factors affecting demand | | | |
| | 4 th | 1.3 Methods of forecasting population, Numerical problems using different methods | | | |
| 2nd WEEK | 1 st | 1.3 Methods of forecasting population, Numerical problems using different methods | | | |
| | 2 ND | 1.3 Methods of forecasting population, Numerical problems using different methods | | | |
| | 3 rd | 1.4 Impurities in water – organic and inorganic, Harmful effects of impurities | | | |
| | 4 th | 1.5 Analysis of water –physical, chemical and bacteriological | | | |
| 3rd WEEK | 1 st | 1.6 Water quality standards for different uses | | | |
| | | 2. Sources and Conveyance of water (8P) | | | |
| | 2 ND | 2.1 Surface sources – Lake, stream, river and impounded reservoir 2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well | | | |
| | 3 rd | 2.3 Yield from well- methods of determination, Numerical problems using yield formulae (deduction excluded) | | | |
| | 4 th | 2.4 Intakes – types, description of river intake, reservoir intake, canal intake | | | |
| 4th WEEK | 1 st | 2.5 Pumps for conveyance & distribution – types, selection, installation | | | |
| | 2 ND | 2.6 Pipe materials – necessity, suitability, merits & demerits of each type | | | |
| | 3 rd | 2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method | | | |
| | | 3. Treatment of water (12P) | | | |
| | 4 th | 3.1 Flow diagram of conventional water treatment system | | | |
| 5th WEEK | 1 st | 3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – | | | |
| | 2 ND | 3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, | | | |
| | 3 rd | 3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only) | | | |
| | 4 th | 3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features | | | |
| 6th WEEK | 1 st | 3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features | | | |
| | 2 ND | 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 | | | |
| | 3 rd | 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 | | | |
| | 4 th | 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 st | 3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only) | | | |

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| 7th WEEK | | 4. Distribution system and Appurtenance in distribution system (8P) | |
| | 2 ND | 4.1 General requirements, types of distribution system-gravity, direct and | |
| | 3 rd | 4.1 General requirements, types of distribution system-gravity, direct and | |
| | 4 th | 4.2 Methods of supply – intermittent and continuous | |
| 8th WEEK | 1 st | 4.3 Distribution system layout – types, comparison, suitability | |
| | 2 ND | 4.3 Distribution system layout – types, comparison, suitability | |
| | 3 rd | 4.4 Valves-types, features, uses, purpose-slucice valves, check valves, air valves, scour valves, Fire hydrants, Water meters SECTION B: WASTE WATER ENGINEERING6. Introduction(5P) | |
| | 4 th | 6.1 Aims and objectives of sanitary engineering | |
| 9th WEEK | 1 st | 6.2 Definition of terms related to sanitary engineering Carriage System – features, comparison, suitability | |
| | 2 ND | 6.2 Definition of terms related to sanitary engineering Carriage System – features, comparison, suitability | |
| | 4 th | 6.3 Systems of collection of wastes– Conservancy and Water | |
| 10th WEEK | 2 ND | 6.3 Systems of collection of wastes– Conservancy and Water | |
| | | 7. Quantity and Quality of sewage (7P) | |
| | 3 rd | 7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in | |
| | 4 th | 7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring | |
| 11th WEEK | 1 st | 7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring | |
| | 2 ND | 7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological | |
| | 3 rd | 7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD 8. Sewerage system (5P) | |
| | 4 th | 8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability | |
| 12th WEEK | 1 st | 8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability | |
| | 2 ND | 8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability | |
| | 3 rd | 8.3 Laying of sewer-setting out sewer alignment | |
| 13th WEEK | | VACATION | Durga Puja |
| 14th WEEK | | 9. Sewer appurtenances and Sewage Disposal (7P) | |
| | 1 st | 9.1 Manholes and Lamp holes – types, features, location, function | |
| | 2 ND | 9.2 Inlets, Grease & oil trap – features, location, function | |
| | 3 rd | 9.3 Storm regulator, inverted siphon – features, location, function | |
| 15th WEEK | 4 th | 9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies | |
| | 1 st | 9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies | |
| | 2 ND | 9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream 10. Sewage treatment (8P) | |
| | 3 rd | 10.1 Principles of treatment, flow diagram of conventional treatment | |
| | 4 th | 10.1 Principles of treatment, flow diagram of conventional treatment | |
| 16th WEEK | 1 st | 10.2 Primary treatment – necessity, principles, essential features, functions | |
| | 2 ND | 10.2 Primary treatment – necessity, principles, essential features, functions | |
| | 3 rd | 10.2 Primary treatment – necessity, principles, essential features, functions | |
| | 4 th | 10.3 Secondary treatment – necessity, principles, essential features, functions | |
| | | 5. W/s plumbing in building (2P) | |
| | 1 st | 5.1 Method of connection from water mains to building supply | |
| | 2 ND | 5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code. | |

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| 17th WEEK | | 11. Sanitary plumbing for building (3P) | |
| | 3 rd | 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage. 11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice. | |
| | 4 th | 11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe. | |
| 18th WEEK | 2 ND | REVISION | |


 11/05/23
 SIGNATURE OF THE FACULTY