## LESSON PLAN ( WINTER-2021)

## DEPARTMENT OF CIVIL ENGINEERING, OSME, KEONJHAR

**SUBJECT-** WATER SUPPLY AND WASTE WATER ENGINEERING | **SEMESTER-**5th (3rd Year)

**FACULTY-** Soumya Sucharita Maharana

| WEEK | DATE | NO. OF CLASSES | TOPICS TO BE COVERED |
|---|---|---|---|
| | | | **SECTION A-WATER SUPPLY** |
| **CHAPTER 1** :- Introduction to Water Supply, Quantity and Quality of water | | | |
| 1ST | 04.10.21 | 1 | 1.1 Necessity of treated water supply |
| | 06.10.21 | 1 | 1.2 Per capita demand, variation in demand and factors affecting demand |
| | 07.10.21 | 2 | 1.3 Methods of forecasting population, Numerical problems using different methods |
| | 09.10.21 | 1 | 1.4 Impurities in water – organic and inorganic, Harmful effects of impurities |
| 2ND | 18.10.21 | 1 | 1.5 Analysis of water –physical, chemical and bacteriological |
| | 20.10.21 | 1 | 1.6 Water quality standards for different uses |
| **CHAPTER 2** :-Sources and Conveyance of water | | | |
| 2ND | 21.10.21 | 2 | 2.1 Surface sources – Lake, stream, river and impounded reservoir |
| | 23.10.21 | 1 | 2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well |
| 3RD | 25.10.21 | 1 | 2.3 Yield from well- method s of determination, Numerical problems using yield formulae ( deduction excluded) |
| | 27.10.21 | 1 | 2.4 Intakes – types, description of river intake, reservoir intake, canal intake |
| | 28.10.21 | 2 | 2.5 Pumps for conveyance & distribution – types, selection, installation. |
| | 30.10.21 | 1 | 2.6 Pipe materials – necessity, suitability, merits & demerits of each type |
| 4TH | 01.11.21 | 1 | 2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method |
| | 03.11.21 | 1 | **CLASS TEST – 1** |
| **CHAPTER 3**:-Treatment of water | | | |
| 4TH | 06.11.21 | 1 | 3.1 Flow diagram of conventional water treatment system |
| 5TH | 08.11.21 | 1 | 3.2 Treatment process / units : 3.2.1 Aeration ; Necessity |
| | 11.11.21 | 2 | 3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance |
| | 13.11.21 | 1 | 3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only) |
| 6TH | 15.11.21 | 1 | 3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features |
| | 17.11.21 | 1 | 3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, superchlorination |
| | 18.11.21 | 2 | 3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only) |

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| **CHAPTER 4:-** Distribution system And Appurtenance in distribution system: | | | |
| 6TH | 20.11.21 | 1 | 4.1 General requirements, types of distribution system-gravity, direct and combined |
| 7TH | 22.11.21 | 1 | 4.2 Methods of supply – intermittent and continuous 4.3 Distribution system layout – types, comparison, suitability |
| | 25.11.21 | 2 | 4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters |
| | 27.11.21 | 1 | **REVISION** |
| **SECTION B: WASTE WATER ENGINEERING** | | | |
| **CHAPTER 6:-** Introduction | | | |
| 8TH | 29.11.21 | 1 | 6.1 Aims and objectives of sanitary engineering 6.2 Definition of terms related to sanitary engineering |
| | 01.12.21 | 1 | 6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability |
| **CHAPTER 7:-** Quantity and Quality of sewage | | | |
| 8TH | 02.12.21 | 2 | 7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage. 7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring |
| | 04.12.21 | 1 | 7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological |
| 10TH | 06.12.21 | 1 | 7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD |
| | 08.12.21 | 1 | **CLASS TEST - 2** |
| **CHAPTER 8:-** Sewerage system | | | |
| 10TH | 09.12.21 | 2 | 8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability |
| | 11.12.21 | 1 | 8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability 8.3 Laying of sewer-setting out sewer alignment |
| **SECTION A-WATER SUPPLY** | | | |
| **CHAPTER-5:-** W/s plumbing in building | | | |
| 11TH | 13.12.21 | 1 | 5.1 Method of connection from water mains to building supply |
| | 15.12.21 | 1 | 5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code., |
| | 16.12.21 | 2 | **REVISION** |
| **SECTION B: WASTE WATER ENGINEERING** | | | |
| **CHAPTER 9:-** Sewer appurtenances and Sewage Disposal: | | | |
| 11TH | 18.12.21 | 1 | 9.1 Manholes and Lamp holes – types, features, location, function |
| 12TH | 20.12.21 | 1 | 9.2 Inlets, Grease & oil trap – features, location, function |
| | 22.12.21 | 1 | 9.3 Storm regulator, inverted siphon – features, location, function 9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies |
| | 23.12.21 | 2 | 9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream |
| **CHAPTER 10 :-** Sewage treatment : | | | |

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| | 03.01.22 | 1 | 10.1 Principles of treatment, flow diagram of conventional treatment |
| 13TH | 05.01.22 | 1 | 10.2 Primary treatment – necessity, principles, essential features, functions |
| | 06.01.22 | 2 | 10.3 Secondary treatment – necessity, principles, essential features, functions |
| | 08.01.22 | 1 | **CLASS TEST 3** |
| **CHAPTER 11** :- Sanitary plumbing for building : | | | |
| | 10.01.22 | 1 | 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage |
| | 12.01.22 | 1 | 11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice |
| 14TH | 13.01.22 | 2 | 11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe |
| | 15.01.21 | 1 | **REVISION** |
| 15TH | 17.01.21 | 1 | **TOTAL REVISON** |
| **TOTAL** | | **59** | |

S.Mahacang
01/10/21

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HOD Civil