BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK

DEPARTMENT OF CIVIL ENGINEERING



LESSON PLAN

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| SUBJECT: WATER SUPPLY & WASTE WATER ENGINEERING (TH4) | ACCADEMIC SESSION: 2021-22 |
| FACULTY: MR M S KAR | SEMESTER: 5TH |
|  | SEC: B |

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| H O D (Civil Engg.) |

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| **Discipline:**  **Civil Engineering** | **Semester : 5th** | | **Name Of Teaching Faculty:-**  **MAHAMRUTYUNJAYA SIVAPRASAD KAR** |
| **Subject:**  **Water Supply & Waste Water Engineering** | **No. of Days/week class allotted : 05 period per week**  **(Mon,Thu,Fri-1 Period Each & Sat-2 Period)** | | **Semester From Date: 01-10-2021 to Date: 08-01-2021**  **No of Weeks: 14 weeks** |
| **Week** | **Date** | **No of period available** | **Topics to be covered** |
| 1st | 01/10/2021 | 1 | **1 Introduction to Water Supply, Quantity and Quality of water**  1.1 Necessity of treated water supply  1.2 Per capita demand, variation in demand and factors affecting demand |
| 2nd | 04/10/2021 | 1 | 1.3 Methods of forecasting population, Numerical problems using different methods |
| 07/10/2021 | 1 | 1.4 Impurities in water – organic and inorganic, Harmful effects of impurities |
| 08/10/2021 | 1 | 1.5 Analysis of water –physical, chemical |
| 09/10/2021 | 2 | bacteriological analysis of water,  1.6 Water quality standards for different uses |
| 3rd | 21/10/2021 | 1 | **2 Sources and Conveyance of water**  2.1 Surface sources – Lake, stream, river and impounded reservoir  2.2 Underground sources – aquifer type occurrence – Infiltration gallery, infiltration well, springs, well |
| 22/10/2021 | 1 | 2.3 Yield from well- methods of determination, Numerical problems using yield formulae ( deduction excluded) |
| 23/10/2021 | 2 | 2.4 Intakes – types, description of river intake, reservoir intake, canal intake |
| 4th | 25/10/2021 | 1 | 2.5 Pumps for conveyance & distribution – types, selection, installation.2.6 Pipe materials – necessity, suitability, merits& demerits of each type |
| 28/10/2021 | 1 | 2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing, Laying of pipes – method |
| 29/10/2021 | 1 | Monthly Class Test |
| 30/10/2021 | 2 | **3 Treatment of water**  3.1 Flow diagram of conventional water treatment system  3.2 Treatment process / units :  3.2.1 Aeration ; Necessity |
| 5th | 01/11/2021 | 1 | 3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance |
| 05/11/2021 | 1 | 3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, |
| 06/11/2021 | 2 | Flash Mixer, Flocculator, Clarifier (Definition and concept only) 3.2.4 Filtration : Necessity, principles |
| 6th | 08 /11/2021 | 1 | types of filters,Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features |
| 11/11/2021 | 1 | 3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, |
| 12/11/2021 | 1 | available chlorine, residual chlorine, pre-chlorination, break point chlorination, super-chlorination |
| 13/11/2021 | 2 | 3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method |
| 7TH | 15/11/2021 | 1 | **4 Distribution system And Appurtenance in distribution system:**  4.1 General requirements, types of distribution system-gravity, direct and combined |
| 18/11/2021 | 1 | 4.2 Methods of supply – intermittent and continuous |
| 20/11/2021 | 2 | 4.3 Distribution system layout – types, comparison, suitability |
| 8TH | 22/11/2021 | 1 | 4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters |
| 25/11/2021 | 1 | **5 Water supply Plumbing in building :**5.1 Method of connection from water mains to building supply  5.2 General layout of plumbing arrangement for water supply in single storied, |
| 26/11/2021 | 1 | Plumbing arrangement for water supply in multi-storied building as per I.S. code.  **SECTION B: WASTE WATER ENGINEERING**  **6 Introduction**  6.1 Aims and objectives of sanitary engineering |
| 27/11/2021 | 2 | 6.2 Definition of terms related to sanitary engineering  6.3 Systems of collection of wastes– Conservancy and Water Carriage System –features, comparison, suitability. |
| 9TH | 29/11/2021 | 1 | Monthly Class Test |
| 02/12/2021 | 1 | Internal Assessment Test |
| 03/12/2021 | 1 | Internal Assessment Test |
| 04/12/2021 | 2 | **7 Quantity and Quality of sewage**  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 |
| 10TH | 06 /12/2021 | 1 | 7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological |
| 09/12/2021 | 1 | 7.4 Concept of sewage sampling, tests for – solids, pH, dissolved oxygen, BOD,COD |
| 10/12/2021 | 1 | **8 Sewerage system**  8.1 Types of system-separate, combined, partially separate features, comparison between the types, suitability |
| 11/12/2021 | 2 | 8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability. |
| 11TH | 13/12/2021 | 1 | 8.3 Laying of sewer-setting out sewer alignment |
| 16/12/2021 | 1 | **9 Sewer appurtenances and Sewage Disposal:**  9.1 Manholes and Lamp holes – types, features, location, function |
| 17/12/2021 | 1 | 9.2 Inlets, Grease & oil trap features, location, function |
| 18/12/2021 | 2 | 9.3 Storm regulator, inverted siphon – features, location, function |
| 12TH | 21/12/2021 | 1 | 9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies |
| 23/12/2021 | 1 | 9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream |
| 24/12/2021 | 1 | **10 Sewage treatment :**  10.1 Principles of treatment, flow diagram of conventional treatment |
| 13TH | 27/12/2021 | 1 | 10.2 Primary treatment – necessity, principles, essential features, functions |
| 30/12/2021 | 1 | 10.3 Secondary treatment – necessity, principles, essential features, functions.  **11 Sanitary plumbing for building** :  11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage |
| 31/12/2021 | 1 | Monthly Class Test |
| 14TH | 03/01/2022 | 1 | 11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice |
| 06/01/2022 | 1 | 11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe |
| 07/01/2022 | 1 | Revision |
| 08/01/2022 | 2 | Previous Year Question Discussion |