

**GOVERNMENT POLYTECHNIC, SAMBALPUR (RENGALI)**

NAME OF THE FACULTY: **PRATYUSH PANDA (PTGF), Civil Engineering**

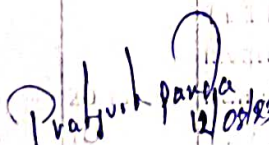
LESSON PLAN FOR **WATER SUPPLY AND WASTE WATER ENGINEERING FOR 5TH SEM,**  
**CIVIL ENGG, WINTER-2023 W.E.F. 12.08.2023**


WEEK NO.	DATE	TOPIC	PERIODS ASSIGNED PER TOPIC	PERIODS AVAILABLE PER WEEK
W-1	01.08.23 TO 05.08.23	<b>SECTION A: WATER SUPPLY</b>  <b>1. Introduction to Water Supply, Quantity and Quality of water</b> 1.1 Necessity of treated water supply 1.2 Per capita demand, variation in demand and factors affecting demand 1.3 Methods of forecasting population, Numerical problems using different methods	10	5
	07.08.23 TO 12.08.23	1.4 Impurities in water – organic and inorganic Harmful effects of impurities 1.5 Analysis of water –physical, chemical and bacteriological 1.6 Water quality standards for different uses		5
W-2	01.08.23 TO 05.08.23	<b>2. Sources and Conveyance of water</b> 2.1 Surface sources – Lake, stream, river and impounded reservoir 2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well	10	5
	14.08.23 TO 19.08.23	2.3 Yield from well- methods of determination, Numerical problems using yield formulae ( deduction excluded) 2.4 Intakes – types, description of river intake, reservoir intake, canal intake		4
W-3	07.08.23 TO 12.08.23	2.5 Pumps for conveyance & distribution – types, selection, installation. 2.6 Pipe materials – necessity, suitability, merits & demerits of each type	8	4
	21.08.23 TO 26.08.23	2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method		
W-4	19.08.23 TO 28.08.23	<b>3. Treatment of water</b> Note: 1. Design of treatment units excluded.	5	4
	02.09.23	2. Students may be asked to prepare detailed sketches of units, preferably from working drawing, as home assignment		5


W-6	04.09.23 TO 09.09.23	<p>3. Field visit to treatment plant, under practical should be arranged after covering this unit.</p> <p>3.1 Flow diagram of conventional water treatment system</p> <p>3.2 Treatment process / units :</p> <p>3.2.1 Aeration ; Necessity</p> <p>3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation &amp; maintenance</p> <p>3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)</p> <p>3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features</p> <p>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</p> <p>3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)</p>	12	5
W-7	11.09.23 TO 16.09.23	<p>3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept Only)</p>		2
W-8	18.09.23 TO 23.09.23	<p><b>4. Distribution system And Appurtenance in distribution system:</b></p> <p>4.1 General requirements, types of distribution system- gravity, direct and combined</p> <p>4.2 Methods of supply – intermittent and continuous</p> <p>4.3 Distribution system layout – types, comparison, suitability</p>	8	5
W-9	25.09.23 TO 30.09.23	<p>4.4 Valves-types, features, uses, purpose-slucie valves, check valves, air valves, scour valves, Fire hydrants, Water meters</p>		3
W-9	18.09.23 TO 23.09.23	<p><b>5. W/s plumbing in building :</b></p> <p>5.1 Method of connection from water mains to building supply.</p> <p>5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.</p>	2	2

W-10	03.10.23 TO 07.10.23	<b>SECTION B: WASTE WATER ENGINEERING</b>  <b>6. Introduction</b> 6.1 Aims and objectives of sanitary engineering 6.2 Definition of terms related to sanitary engineering 6.3 Systems of collection of wastes- Conservancy and Water Carriage System – features, comparison, suitability	5	5
W-11	09.10.23 TO 14.10.23	<b>7. Quantity and Quality of sewage</b> 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.	7	5
W-12	03.10.23 TO 07.10.23 16.10.23 TO 20.10.23	7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological 7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD	7	2
	09.10.23 TO 14.10.23	<b>8. Sewerage system</b> 8.1 Types of system-separate, combined, partially separate ; features, comparison between the types, suitability	5	3
W-13	30.10.23 TO 04.11.23	8.2 Shapes of sewer –rectangular, circular, avoid-features; suitability 8.3 Laying of sewer-setting out sewer alignment  <b>9. Sewer appurtenances and Sewage Disposal:</b> 9.1 Manholes and Lamp holes – types, features, location, function 9.2 Inlets, Grease & oil trap – features, location, function 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 9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream	7	4       3

W-14	06.11.23 TO 11.11.23	<b>10. Sewage treatment :</b> (Note: 1.Design of treatment units excluded. 2.Students may be asked to prepare detailed sketches of units, preferably from working drawing, as home assignment: 3.Field visit to treatment plant, under practical should be arranged after covering this unit.)	8	4
W-15	13.11.23 TO 18.11.23	10.1 Principles of treatment, flow diagram of conventional treatment 10.2 Primary treatment – necessity, principles, essential features, functions 10.3 Secondary treatment – necessity, principles, essential features, functions		4
W-16	20.11.23 TO 25.11.23	<b>11. Sanitary plumbing for building :</b> 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 11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe	3	3
W-17	28.11.23 TO 30.11.23	REVISION & PREVIOUS YEAR QUESTION DISCUSSION	-	-

  
SIGNATURE OF SUBJECT TEACHER  
CIVIL ENGG DEPT

  
SIGNATURE OF HOD (T/C)  
CIVIL ENGG DEPT  
Civil Engg. Dept.  
GP SBP (Rengali)

  
C/S BY PRINCIPAL  
G.P. SAMBALPUR  
Govt. Polytechnic, Sambalpur  
Rengali-768212 (Odisha)