

ACADEMIC LESSON PLAN FOR WINTER 2023
DEPT. OF CIVIL ENGG. GOVT. POLYTECHNIC BALASORE
NAME OF THE FACULTY – BIKASH KUMAR PATRA
WATER SUPPLY & WASTE WATER ENGINEERING

Course code- Th-4
 Theory – 5P/W
 Total period – 75P/Sem
 Examination – 3hrs

Class test- 20
 End semester exam-80
 Total mark- 100
 Start From- 15th September

WEEK	PERIOD	TOPIC
1 ST	1 st	Introduction to water supply Quantity and Quality of water.
	2 nd	Per capita consumption for domestic, public and fire fighting uses
	3 rd	Variation in demands and factor affecting demand.
	4 th	Methods of Population Forecasting and their numerical problems.
	5 th	Numerical problems on population forecasting.
2 ND	1 st	Quality of Water Meaning of pure water and methods of analysis of water.
	2 nd	Physical, Chemical and bacteriological tests and their significance.
	3 rd	Standard of potable water as per Indian Standard
	4 th	Maintenance of purity of water (small scale and large scale quantity)
	5 th	Impurities in water- organic and inorganic, harmful effects of impurities.
3 RD	1 st	Sources and conveyance of water. Surface sources- lake, stream, river and impound reservoir.
	2 nd	Underground sources- aquifer type & occurrence - infiltration gallery, infiltration well, springs, well.
	3 rd	Yield from well – methods of determination, numerical problems.
	4 th	Intakes – types, description of river intake, reservoir intake, canal intake.

	5 th	Pumps for conveyance and distribution- types, selection, distribution.
4 TH	1 st	Pipe materials- necessity, suitability, merits and demerits of each type.
	2 nd	Pipe joints - necessity type of joints.
	3 rd	Methods of jointing, laying of pipes.
	4 th	Study of treatment of water, treatment process and units.
	5 th	Study of aeration and its necessity.
5 TH	1 st	Plain sedimentation necessity, working principle.
	2 nd	Sedimentation tanks types, essential features, operation and maintenance.
	3 rd	Sedimentation with coagulation, necessity, principles of coagulation, types of coagulants.
	4 th	Flash mixer, flocculator, clarifier.
	5 th	Filtration, necessity, principles.
6 TH	1 st	Types of filters Slow sand filter, Rapid sand filter and Pressure filter.
	2 nd	Types of filters Slow sand filter, Rapid sand filter and Pressure filter. Essential features.
	3 rd	Construction of slow sand rapid sand filter with neat sketch.
	4 th	Disinfection, methods of disinfection, necessity.
	5 th	Disinfection, methods of disinfection, necessity.
7 TH	1 st	Chlorination free and combined chlorine demand.
	2 nd	Chlorination free and combined chlorine demand.
	3 rd	Available chlorine, residual chlorine, prechlorination, super chlorination.
	4 th	Softening of water, its necessity.
	5 th	Methods of softening- Lime soda process and ion exchange.

8 TH	1 st	Distribution system layout- types, comparison, suitability.
	2 nd	Valves types, features uses, purpose sluice valves.
	3 rd	Study of check valves, air valves, scour valves, fire hydrant water meters.
	4 th	Methods of connection from water mains to building supply.
	5 th	General layout of plumbing arrangement for water supply in single storied and multi storied building .
9 TH	1 st	Introduction to waste water engineering.
	2 nd	Aims and objectives of sanitary engineering.
	3 rd	Definition of terms related to sanitary engineering.
	4 th	System of collection of wastes.
	5 th	Conservancy and Water carriage system, features comparison suitability.
10 TH	1 st	Quantity of sanitary sewage- domestic and industrial sewage, variation in sewage flow.
	2 nd	Numerical problem on computation quantity of sanitary sewage.
	3 rd	Computation of size of sewer, application of Chezy's formula.
	4 th	Limiting velocities of flow- self cleaning and scouring.
	5 th	General importance strength of sewer. Characteristics of sewage physical chemical and biological.
11 TH	1 st	Concept of sewage sampling, tests for solids, PH dissolved oxygen. BOD, COD.
	2 nd	Concept of sewage sampling, tests for solids, PH dissolved oxygen. BOD, COD.
	3 rd	Study of sewerage system.
	4 th	Types of system- separate, combined, partially separate.
	5 th	Its features, comparison between the types and suitability.
12 TH	1 st	Shape of sewer- rectangular, circular. Its suitability.
	2 nd	Laying of sewer, setting out sewer alignment.

13 TH	3 rd	Sewer appurtenances and sewage disposal.
	4 th	Manholes and lamp holes- types, features, location, function.
	5 th	Inlet, grease and oil trap- features, location, function.
	1 st	Storm regulator, inverted siphon- features, location, function.
	2 nd	Disposal on land sewage farming, sewage application and dosing.
14 TH	3 rd	Sewage sickness- causes and remedies.
	4 th	Disposal by dilution- standards for disposal in different types of water bodies, self purification.
	5 th	Study of sewage treatment unit.
	1 st	Principle of treatment flow diagram of conventional treatment.
	2 nd	Principle of treatment flow diagram of conventional treatment.
15 TH	3 rd	Primary treatment- necessity, principles, essential features, function.
	4 th	Primary treatment- necessity, principles, essential features, function.
	5 th	Secondary treatment- necessity, principles, essential features, function.
	1 st	Secondary treatment- necessity, principles, essential features, function.
	2 nd	Revision class of sewage treatment.
15 TH	3 rd	Requirements of building drainage, layout of lavatories block in residential buildings
	4 th	Plumbing arrangement of single storied and multi storied building.
	5 th	Sanitary fixtures- features function and maintenance and fixing of the fixtures- water closets, flushing cisterns.

Done
24/07/23