



Department of Civil Engineering		LP: CE18504
B.E	: Civil Engineering Regulation: 2018	Rev. No: 01
PG Specialisation	: NA	Date: 27-07-2022
Sub. Code / Sub. Name	: CE18504 / Water Supply Engineering	
Unit	: 1 / Sources and Quality of Water	

Unit Syllabus: Public water supply system -Planning - Objectives -Design period - Population forecasting -Water demand -Sources of water and their characteristics -Surface and Groundwater- Impounding Reservoir -Development and selection of source – Source Water quality - Characterization – Significance – Drinking water quality standards.

Objective: To make the students conversant with importance and planning for water supply system, methods to forecast population, different types of water demand, sources of water and water characteristics.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Public water supply system: Planning and Objectives	Ref 1 – Ch 1 ; Page 1 – 21 1 – Ch 13 ; Page 729– 733 4 – Ch 2 page 11	PPT & Black Board
2	Design period and Population forecasting 1. Arithmetic Increase Methods	1 – Ch 2 ; Page 23 - 42 4 – Ch 2 page 13 and 16	PPT & Black Board
3	Population forecasting: 2. Geometric Increase Method 3. Incremental Increase Method	1 – Ch 2 ; Page 23- 42 4 – Ch 2 page 16 – 23	PPT & Black Board
4	Population forecasting: 4. Decreasing rate of growth method 5. Simple Graphical Method	1 – Ch 2 ; Page 23-42 4 – Ch 2 page 16 - 23	PPT & Black Board
5	Population forecasting: 6. Comparative Graphical Method 7. Master Plan Method 8. The Ratio Method	1 – Ch 2 ; Page 23-42 4 – Ch 2 page 16 - 23	PPT & Black Board
6	Population forecasting: 9. The Logistic Curve Method	1 – Ch 2 ; Page 23-42	PPT & Black Board
7	Water demand, Sources of water and their characteristics: Surface and Groundwater	1 – Ch 2 ; Page 7 – 22 1 – Ch 8; Page 320- 372 4 – Ch 3 page 26 – 34 1 – Ch 3 ; Page 50– 53 1 – Ch 4 ; Page 112 – 193	PPT & Black Board
8	Impounding Reservoir and Development and selection of source	1 – Ch 4 ; Page 66 - 95	PPT & Black Board
9	Source Water quality: Characterization and standards	1 – Ch 8 ; Page 320-372	PPT & Black Board
Content beyond syllabus covered (if any): Nil			

* Session duration: 50 minutes



Sub. Code / Sub. Name: CE18504/ Water Supply Engineering

Unit : II / Conveyance from the Source

Unit Syllabus : Water supply – intake structures – Functions; Pipes and conduits for water – Pipe materials – Hydraulics of flow in pipes – Transmission main design – Laying, jointing and testing of pipes – appurtenances – Types and capacity of pumps – Selection of pumps and pipe materials.

Objective: To make the students conversant with different types of intake structure, pipes, conduits, transmission main design, appurtenances and pumps.

Session No *	Topics to be covered	Ref	Teaching Aids
10	Water supply: intake structures and it's Functions and drawings	1 – Ch 5 ; Page 200 - 216	PPT & Black Board
11	Pipes and conduits for water and Pipe materials	1 – Ch 6 ; Page 219 - 285	PPT & Black Board
12	Pipe materials and Valves	1 – Ch 6 ; Page 280 - 284	PPT & Black Board
13	Hydraulics of flow in pipes and Transmission main design	1 – Ch 6 ; Page 219 - 264	PPT & Black Board
14	Transmission main design	1 – Ch 6 ; Page 219 - 264	PPT & Black Board
	CAT 1		
15	Laying, jointing and testing of pipes	1 – Ch 6 ; Page 265 - 287	PPT & Black Board
16	Drawings appurtenances	1 – Ch 6 ; Page 265 - 287	PPT & Black Board
17	Types and capacity of pumps	1 – Ch 6 ; Page 289 - 316	PPT & Black Board
18	Selection of pumps and pipe materials.	1 – Ch 6 ; Page 289 - 316	PPT & Black Board
Content beyond syllabus covered (if any): Nil			

* Session duration: 50 mins



Sub Code / Sub Name: CE18504/ Water Supply Engineering

Unit : III / Conventional Water Treatment

Unit Syllabus: Objectives – Unit operations and processes – Principles, functions, and design of water treatment plant units, aerators, flash mixers, Coagulation and flocculation – Clariflocculator- Plate and tube settlers - Pulsator clarifier -sand filters - Disinfection - Residue Management –Operation and Maintenance aspects.

Objective: To make the students conversant with chemical feeding, flash mixers, flocculators, sedimentation tanks and filters, disinfection, residue management and O & M of WTP.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Objectives of WT, Unit operations and processes	3 – Ch 7 ; Page 213 - 219	PPT & Black Board
20	Principles, functions design and drawing of aerators	1 – Ch 9 ; Page 520 - 525	PPT & Black Board
21	Principles, functions design and drawing of Flash mixers	1 – Ch 9 ; Page 373 - 424	PPT & Black Board
22	Principles, functions design and drawing of flocculators	1 – Ch 9 ; Page 424 - 431	PPT & Black Board
23	Principles, functions design and drawing of clariflocculator	1 – Ch 9 ; Page 383 - 410	PPT & Black Board
24	Principles, functions design and drawing of Plate and tube settlers, Pulsator clarifier	1 – Ch 9 ; Page 383 - 410	PPT & Black Board
25	Principles, functions design and drawing of sand filters	1 – Ch 9 ; Page 431 – 474	PPT & Black Board
26	Disinfection and Process flow diagram of Chembrambakkam 500 MLD water treatment	1 – Ch 9 ; Page 474 - 495	PPT & Black Board
27	Residue Management, Construction and Operation & Maintenance aspects of Water	2- Ch- 13 ; Page 463- 484	PPT & Black Board
	CAT 2		

Content beyond syllabus covered (if any): Process flow diagram of Chembrambakkam 500 MLD water treatment plant

* Session duration: 50 mins



Sub Code / Sub Name: CE18504/ Water Supply Engineering

Unit : IV / Advanced Water Treatment

Unit Syllabus: Water softening – Desalination- R.O. Plant – demineralization – Adsorption - Ion exchange– Membrane Systems – RO Reject Management - Iron and Manganese removal - Defluoridation -Operation & Maintenance aspects – Recent advances.

Objective: To make the students conversant with iron and manganese removal, defluoridation, fluoridation, demineralization, water softening, desalination and membrane systems.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Principles and functions Water softening	1 – Ch 9 ; Page 495 - 520	PPT & Black Board
29	Desalination	1 – Ch 9 ; Page 525 - 536	PPT & Black Board
30	R.O. Plant	1 – Ch 9 ; Page 525 - 536	PPT & Black Board
31	Principles and functions of demineralization	1 – Ch 9 ; Page 515 - 520	PPT & Black Board
32	Adsorption and Ion exchange	1 – Ch 9 ; Page 495 - 520	PPT & Black Board
33	Membrane Systems, Zero liquid discharge plant of CPCL and RO Reject Management	1 – Ch 9 ; Page 525 - 536	PPT & Black Board
34	Principles and functions of Iron and manganese removal	1 – Ch 9 ; Page 537 - 525	PPT & Black Board
35	Principles and functions of Defluoridation	1 – Ch 9 ; Page 537 - 525	PPT & Black Board
36	Operation & Maintenance aspects and Recent advances	1 – Ch 9 ; Page 525 - 536	PPT & Black Board

Content beyond syllabus covered (if any): Zero liquid discharge plant of CPCL

* Session duration: 50 mins



Sub Code / Sub Name: CE18504/ Water Supply Engineering

Unit : V / Water Distribution and Supply

Unit Syllabus: Requirements of water distribution – Components – Service reservoirs – Functions – Network design – Analysis of distribution networks –Computer applications – Appurtenances – Leak detection. Principles of design of water supply in buildings – House service connection – Fixtures and fittings, systems of plumbing and types of plumbing.

Objective: To make the students conversant with water distribution components, service reservoirs, network design, distribution appurtenances, water supply in buildings, house service connection and plumbing systems.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Requirements of water distribution and Components	1 – Ch 10 ; Page 579 - 594	PPT & Black Board
38	Service reservoirs: Functions and drawings	1 – Ch 10 ; Page 579 - 594	PPT & Black Board
39	Network design	1 – Ch 10 ; Page 616 - 636	PPT & Black Board
40	Computer applications and Analysis of distribution networks	1 – Ch 10 ; Page 616 - 636	PPT & Black Board
41	Appurtenances, operation and maintenance and Leak detection Methods	1 – Ch 10 ; Page 636 - 643	PPT & Black Board
42	Appurtenances, operation and maintenance, Leak detection methods	1 – Ch 10 ; Page 615 - 616	PPT & Black Board
43	Principles of design of water supply in buildings	1 – Ch 10 ; Page 646 - 660	PPT & Black Board
44	House service connection, Fixtures and fittings	1 – Ch 10 ; Page 646 - 660	PPT & Black Board
45	Systems of plumbing and drawings of types of plumbing.	1 – Ch 10 ; Page 646 - 660	PPT & Black Board
	CAT 3		

Content beyond syllabus covered (if any): Nil



* Session duration: 50 mins



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REFERENCES:

1. Garg, S.K. Environmental Engineering, Vol.I Khanna Publishers, New Delhi, 33rd Edition, 2019.
2. Government of India, "Manual on Water Supply and Treatment", CPHEEO, Ministry of Urban Development, New Delhi, 2013
3. Syed R. Qasim and Edward M. Motley Guang Zhu, "Water Works Engineering Planning", Design and Operation, Prentice Hall of India Private Limited, New Delhi, 2009.
4. R Pannirselvam "Water Supply Engineering" SPGS Publishers, Chennai – 600 088

	Prepared by	Approved by
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Date	27/ 07 /2022	27/ 07 /2022
Remarks *:		
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD