

K L UNIVERSITY
ENVIRONMENTAL ENGINEERING (CE C 210)

SYLLABUS

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UNIT – 1 Water Supply

Public Health Engineering – necessity of protected water supply and sanitation role of civil Engineer, Water demand and per capita consumption, factors affecting – population forecasts, Water supply – sources of water and quality parameters, Standards of potable water, Intake structures, Pipes, joints, valves and pumps

Unit – II Treatment of Water

Clarification, sedimentation- Principles, Design of sedimentation tanks, Coagulation and flocculation, Design of a clari-floccualtor. Filtration – Types of filters and filter media. Design principles of a slow and rapid sand filters. Backwash mechanisms. Pressure filters. Disinfection – Necessity and methods, Chlorination of water supplies, break point chlorination, Ozone and U-V radiation, Removal of hardness, tastes and odor.

Unit – III Sewage & Sewerage Systems

Sewerage systems, Quantity estimation, Velocity in sewers, Storm water sewers- Strom water estimation by rational method. Sewerage system design, Sewage conveyance- Sewer types and appurtenances

Unit – IV Waste Water Treatment

Quality parameters– Physical, Chemical and Bacteriological Preliminary treatment. Screens, grit chambers. Primary treatment- Sedimentation – rectangular and circular sedimentation tanks Secondary treatment- Mechanisms, Activated sludge process & Trickling filter, Designs aspects, Secondary clarifier

Unit – V Sludge Handling & Sanitation & Environmental Pollution

Sludge digestion and disposal methods Septic tanks- design parameters and working principles.

Air Pollution-Types, Impacts on environment, and Principles of control techniques

Solid Wastes-Types, sources and composition of solid wastes, Methods of collection, Transportation and disposal

Noise Pollution and Control-Types, Measurement, Impacts on environment, Control techniques

TEXT BOOKS:

1. Water Supply Engineering by S.K. Garg, (Environmental Engg. Vol- I), Khanna publishers, New Delhi (2010)
2. Sewage Disposal And Air pollution Engineering by S.K. Garg, (Environmental Engg. Vol- II), Khanna publishers, New Delhi (2010)

REFERENCE BOOKS:

1. Environmental Engineering by Howard S. Peavy, Donald R. Rowe and George Tchobanoglous, Mc Graw-Hill International Editions, NewYork (1985)
2. Water and Waste water Technology, Mark. J Hammer and Mark. J Hammer, Eastern Economy Edition, PHI-Learning, New Delhi (2008)
3. Wastewater Engineering Treatment, Disposal & Reuse by Met Calf & Eddy, Tata McGraw – Hill publishing Co. Ltd., New Delhi.
4. Environmental Engineering by Davis Cornvel, McGraw Hill Book Co., New York. (2000)

5. Water and waste water Engineering by G.M. Fair, J.C. Geyer, and Okum, John Wiley & Sons, New York (1998)
6. Waste water Engineering by M.N Rao and A.K Dutta,, Oxford & IBH Publishing Co. Ltd. (2000)

LIST OF EXPERIMENTS

Determination of the following parameters present in the given water/waste water sample:

1. a) pH, b) Electrical Conductivity
2. a) Turbidity b) Jar test
3. Hardness
4. a) Acidity b) Alkalinity
5. Available chlorine and Residual Chlorine
6. Fluoride
7. Iron
8. Total solids, Dissolved solids, Suspended solids & Settleable solids
9. D.O
10. B.O.D
11. C.O.D
12. Chlorides