



SECOND SEMESTER 2015-16

Course Handout (Part-II)

Date: 02/01/2016

In addition to Part-I (General handout for all courses appended to the timetable), this portion gives further specific details regarding the course.

Course No	CE F342
Course Title	Water and Wastewater Treatment
Instructor-in-charge	Dr.Bahurudeen A
Instructor	Dr.Kamalesh Kumar

1. Course description: In this course, the fundamental concepts involved in Water and Wastewater treatment will be discussed. The course coverage includes a wide range of topics such as sources of water, estimation of water requirements and wastewater generation, study of their characteristics, natural methods of purification, different unit operations for treatment of water and wastewater, sludge handling and disposal, advanced wastewater treatment, reuse of wastewater, and hydraulic design of sewer and water supply distribution system. The course has a lab component where the student gets involved in the testing of few physico-chemical parameters of water and wastewater.

2. Scope and Objective of the course: The need of the hour in the world nowadays is "*provision of adequate and potable water supply*". The world is witnessing a war like situation for 'lack of water supply' at many places. The global need is for judicious use of available water and putting efforts to recycle/reuse the treated wastewater for beneficial purposes. This course aims to provide insight to the several technical aspects to be considered in the planning, design, and implementation of water supply and wastewater treatment schemes. Field application of the subject is illustrated through case studies reported in literature.

3. Textbooks:

T1. Punmia B.C, A. Jain and A. Jain. *Water Supply Engineering*, Laxmi Publications, New Delhi, 1995.

T2. Punmia B.C, A. Jain and A. Jain. *Wastewater Engineering*, Laxmi Publications, New Delhi, 1998.

T3. Moondra H.S. and R. Gupta, *Laboratory manual for Civil Engineering*, CBS Publishers & Distributors, Delhi, 1992.





4. Reference books:

R1. Peavey H.S., D. R. Rowe and G. Tchobanoglous. *Environmental Engineering*, McGraw Hill Education (India) Private Limited, 2013.

R2. Garg S.K., *Water Supply Engineering*, Khanna Publishers, Delhi, 2008.

R3. Garg S.K., *Sewage Disposal & Air Pollution Engineering*, Khanna Publishers, Delhi, 2010.

R4. Mackenzie L.Davis., *Water and wastewater Engineering*. McGraw Hill Education (India) Private Limited, 2013.

R4. Relevant IS codes, National and International Journals pertaining to the subject.

5. Course Plan:

Lec. No.	Learning Objectives	Topics to be covered	References
1-5	Introduction to basics of Water Supply (WS) and wastewater (WW) Engineering	Introduction; Estimation of WS & WW; Characteristics	Ch.1 of T1 & T2; Ch. 5 of T1; Ch. 6 of T1; Ch. 8 of T2
6-8	Natural methods for water and wastewater treatment	Self-purification of rivers, Dilution method, Gas transfer	Ch. 7 of T1; Ch.9 of T2
9-18	Unit operations for water treatment	Preliminary treatment, Sedimentation, Filtration, Disinfection	Ch 8-11 of T1
19-31	Unit operations for wastewater treatment	Preliminary treatment, Primary treatment, Secondary treatment	Ch. 11-15 of T2
32-35	Treatment and disposal of sludge	Dewatering, Digestion and disposal	Ch. 16 of T2
36-39	Advanced methods of treatment for water and WW	Ion exchange, Reverse Osmosis, Adsorption, Water softening, Desalination	Ch-18 of T2; Ch. 11 ,12,13of T1
40-44	Application of Hydraulics	Hydraulic design of sewers, WS distribution networks	Ch. 4 of T2; Ch. 16 of T1





6. List of Experiments

1	Determination of Residual Chlorine	1 Turn
2	Determination of Dissolved Oxygen (DO) of water	1 Turn
3	Determination of Alkalinity of water	1 Turn
4	Determination of Acidity of water	1 Turn
5	Determination of Hardness of water	1 Turn
6	Determination of Calcium content in water	1 Turn
7	Determination of Chloride content in water	1 Turn
8	Determination of Fluoride content in water	1 Turn
9	Determination of Sulphate content in water	1 Turn
10	Determination of Iron content in water	1 Turn
11	Determination of pH of water	1 Turn
12	Determination of Solids in wastewater	1 Turn
13	Determination of Turbidity in wastewater	1 Turn
14	Demonstration to determine the Optimum dose of a coagulant	1 Turn
15	Demonstration of COD and BOD	1 Turn

7. Assignments: Comprises of Reading and/or Home assignments. Details will be announced in the class from time to time.

8. Evaluation scheme

Evaluation Component	Duration <i>minutes</i>	Weightage	Date	Time	Venue	Nature of component
Mid-Sem Test	90	25	19/3	2:00 -3:30 PM		CB
Tutorials and Assignments	50	20		Continuous		CB/OB
Lab activity	---	10		1111		OB





Lab Quiz	30	5	To be announced in the class	CB
Comprehensive Examination	180	40	16/5 FN	CB

9. Chamber consultation hour: Thursday 5:00-6:00 pm

10. Make-up policy:

1. Make-up will be granted only on genuine reasons. However, prior permission is must.
2. For medical cases, a certificate from the concerned physician of the Medical Centre must be produced.
3. No make-up will be granted for lab quiz.

11. Academic honesty and academic integrity Policy:

Academic honesty and academic integrity are to be maintained by all of the students throughout the Semester and no type of academic dishonesty is acceptable.

12. Notices: Concerning the course will be displayed on Civil Engineering Notice Board/PHE Lab.

INSTRUCTOR-IN-CHARGE
CE F342

