

Course Description Form

1. Course Name:

Sanitary & Environmental Engineering

2. Course Code:

3. Semester / Year:

Annual System / 2023-2024

4. Description Preparation Date:

1 October 2023

5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)

1. Theoretical Time: 2Hrs/Week / Total: 60Hrs.

2. Lab. Time: 2Hrs / Week / Total: 60Hrs.

3. Tutorial Time: 1Hour / Week / Total: 30Hrs.

7. Course administrator's name (mention all, if more than one name)

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8. Course Objectives

The Course Objectives are to help

1. Knowing a general Introduction about the

students to:

- Sanitary Engineering.
2. Knowing how to estimate the quantity of water during the design of any waterworks project, and what is necessary to estimate the amount of water, determining the number of people who will be served and their per capita water consumption.
 3. The quality of water supplies and their requirements for multi uses of water.
 4. Take a look on the water distribution systems in general form
 5. Knowing the description of intakes, the general requirements for the location of intakes and design criteria of intake structures. Besides, several types of intakes and the screens. The general requirements for the location and the design criteria of screens.
 6. Studying the pumps and pumping stations., the general requirements for the design of pumps and pumping stations. Besides, several types of pumps.
 7. Knowing the nature of Coagulation and Flocculation in water, its reasons and removal requirements.
 8. Looking for the description of the water clarification (sedimentation) process, the general requirements for the design of the sedimentation tank. Besides, the sedimentation theory, the design criteria and the types of sedimentation tanks.
 9. Knowing the basic information regarding water filtration process, the general requirements for the design of the filtration unit, the types of filters according to process workability and media. Besides, the design criteria of filtration unit.
 10. Knowing all information about the water disinfection, its method, ...etc.
 11. Studying the Special treatments of Hardness Removal or Water Softening.
 12. Take a general look on introduction to wastewater or sewage, definitions to main terms used with wastewater engineering, the main parts of wastewater collection system and the types of wastewater flowing in the sewer system. Besides, the characteristics of wastewater and the determination of organic matters.
 13. Studying all about the quantity of wastewater.
 14. Provided by the essential information regarding sewer systems, the components of sewer systems, sewer type and sewer materials. In addition, the flow in sewer systems and the design criteria of sewer network.
 15. Obtaining the Appurtenances of the sewer

- system.
16. Provided by the essential information regarding sewer disposal and environmental regulation.
 17. Knowing, in general, about wastewater or sewage treatment plant, its Preliminary and Primary Treatment, and the biological treatment.

9. Teaching and Learning Strategies

Strategy

- 1- Classic theoretical classes.
- 2- Practical classes and experimental measurements using laboratory equipment.
- 3- E-learning.
- 4- Discussion and responding to students' questions.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	1. Understanding environmental issues relevant to civil engineering-related activities.	General concepts of Sanitary & Environmental Engineering	In class	1. Oral examination during daily classes. 2. Joined discussions during lectures. 3. Attendance. 4. Monthly examinations. 5. Mid-year examinations. 6. Final-Year examinations.
2	5	2. Reinforcing the implications of processes such as construction within a natural system.	Depreciation water	In class	
3	5	3. Familiarity with preventive and management strategies to combat water, soil, air, and noise pollution.	Expectation population: Ways and the factors affecting the Expectation population	In class	
4	5		Calculate the required amount of water for fire fighting	In class	
5	5	4. Identifying concepts of water pollution control mechanisms and their impact on	Types of pipes, valves and accessories	In class	
6	5		Types of systems used in water distribution	In class	

7, 8	10	<p>design.</p> <p>5. Applying knowledge of mathematics and science to solve complex environmental and sanitary engineering problems.</p> <p>6. Designing and conducting experiments, as well as analyzing and interpreting data.</p>	Hardy Cruz method in network analysis	In class
9, 10	10		Pumps: Kinds of pumps and energy calculations	In class
11	5		Water outlet: Types and design outlet	In class
12	5		Coagulation and sintering process and calculate the amount of coagulase material	In class
13	5		Sintering process and sintering basins design	In class
14	5		Sedimentation theory and design of sedimentation basins in water processor stations	In class
15	5		Filtration process: Types of filters	In class
16	5		Design of sandy quickly filter and wash process of filter	In class
17	5		Pasteurization: Types of materials used in the Pasteurization, efficiency of Pasteurizer	In class
18	5		Refraction Point of chlorine: Calculation of free residual chlorine, calculate the time to seek Chlorine	In class

19	5		Estimate the amount of sewage: Kinds of treatments for sewage	In class
20, 21	10		Sewage Treatment Station: Refineries, reserve water basins	In class
22, 23	10		Design of preliminary sedimentation basins for drainage and final sedimentation basin	In class
24, 25	10		Biological treatment of wastewater using activated sludge method	In class
26	5		Biological treatment of wastewater using drip filters	In class
27	5		Concepts of environmental pollution: Organic load, requirement of bio oxygen	In class
28	5		Pollution of rivers: Curved of dissolved oxygen in the river	In class
29	5		Concepts in the management of solid waste	In class
30	5		Introduction of air pollution:	In class

11.Course Evaluation

The score of this material is as follows:

1. (50 of 100) degrees will be divided unequally between the daily attendance, daily preparation, daily oral, monthly examinations, solving problems as H.W., and the reports related to lab. Tests.
2. (50 of 100) degrees for the final examination.

12.Learning and Teaching Resources

Steel, E.W. and McGhee, T.J., 1979. Water supply and sewerage (5th edition). New York: McGraw-Hill.

Baruth, E.E. and American Water Works Association, 2005. Water treatment plant design.

Davis, M.L., 2010. Water and wastewater engineering. McGraw-Hill.

Metcalf, I.N.C., 2003. Wastewater engineering; treatment and reuse. McGraw-Hill.