Course Specification

(Bachelor)

Course Title:	Sanitary Engineering
Course Code:	COE4602
Program:	Construction Engineering
Department:	Civil and Environmental Engineering Department
College:	College of Engineering and Computing in Al-Qunfudhah
Institution:	Umm Al-Qura University
Version:	4th
Last Revision Date:	18 January 2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (7/4)					
4. Course General Description:					
The course presents an introduction to water resources, population forecasting, collection methods of water, the different potable water purification stages, structures of the water storage, networks of potable water, different stages of the treatment and reuse of the wastewater, the design concepts of sewers, introduction to solid wastes.					
5. Pre-requirements for this course (if any)**:**					
Fluid Mechanics and Hydraulics (COE3601)					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
1- Recognize the quantity and quality of water and wastewater. 2- Realize the different purification stages of the water. 3- Select and design the appropriate distribution systems of water. 4- Design different units in a wastewater treatment plant.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100 %

No	Mode of Instruction	Contact Hours	Percentage
2	E-learning	None	None
3	Hybrid • Traditional classroom • E-learning	None	None
4	Distance learning	None	

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	None
3.	**Field**	None
4.	**Tutorial**	None
5.	**Others (specify)**	None
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify the role of sanitation, sources of water supply, water demands, water treatment system, and types of collection and distribution of water	**K1**	Lecture	Assignment, Quiz, Midterm and final exam
1.2	Recognize the quantity and quality of water and wastewater	**K1**	Lecture	Assignment, Quiz, Midterm and final exam
2.0	**Skills**			

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.1	Design of mechanical and chemical water treatment systems, pipe network systems, and sewer systems.	**S1**	Lecture	Assignment, Quiz, Midterm and final exam
2.1	Select and design the appropriate distribution systems of water.	**S2**	Lecture	Assignment, Quiz, Midterm and final exam
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
…				

C. Course Content

No	List of Topics	Contact Hours
1.	Course Description and Introduction to the water resources and population forecasting	**9**
2.	Purification processes of water (Quality of water supply and wastewater and drinking water standards).	**9**
3.	Collection and Distribution of water.	**9**
4.	General outline of units in a wastewater treatment plant and Design concepts of sewers.	**12**
5.	Solid Wastes.	**3**
6.	Quizzes and Midterm Exam	**3**
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	**2, 5, 8, 11, 14**	**15%**
2.	Quizzes	**4, 11, 14**	**15%**
3.	Midterm exam	**7 or 8**	**30%**
4.	Final exam	**16 or 17**	**40%**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	• "Water supply and wastewater removal", Nazih K. Shammas and Lawrence K. Wang, 3rd ed., John Wiley & Sons, 2011. • "Water and Wastewater Engineering", Mackenzie Davis, McGraw-Hill Professional; 1st ed., 2010
Supportive References	• "Water and wastewater technology", Hammer, Prentice Hall, 2nd edition, 1986.
Electronic Materials	
Other Learning Materials	• "Water supply and sanitary Engineering", G.S. Birdi, Dhanpat Rai & Sons Publishers, 4th ed. 2004.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Equipped Classroom
Technology equipment (projector, smart board, software)	Blackboard, Data show, Smart Board
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Student** **Instructor**	**Indirect** **Direct**
Effectiveness of Students assessment	**Student** **Instructor**	**Indirect** **Direct**
Quality of learning resources	**Student** **Instructor**	**Indirect**
The extent to which CLOs have been achieved	**Instructor**	**Direct**
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Civil and Environmental Engineering Department Council in Al-Qunfudah**
REFERENCE NO.	**The fifteenth session of the academic year 1446**
DATE	**01/05/2025**