



Course Specifications

Course Title:	Water Quality and monitoring
Course Code:	ENS 324
Program:	Environmental Sciences and Technology
Department:	Environmental Sciences
College:	Faculty of Meteorology, Environment and Arid Land Agriculture
Institution:	

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A. Course Identification

1. Credit hours: 3			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	Others <input type="checkbox"/>
3. Level/year at which this course is offered: 6 th Level / 3 rd year			
4. Pre-requisites for this course (if any): ENS309			
5. Co-requisites for this course (if any):			

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	31.5	75%
2	Blended		
3	E-learning	10.5	25%
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	28
2	Laboratory/Studio	28
3	Tutorial	
4	Others (specify)	
	Total	56
Other Learning Hours*		
1	Study	21
2	Assignments	14
3	Library	
4	Projects/Research Essays/Theses	5
5	Others (specify)	
	Total	40

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Introduction to water quality and control techniques. Water sources and usage are studied in the context of the biological, chemical and physical hazards to human health and the ecosystem. Also, water quality monitoring and control is considered.

2. Course Main Objective

By the end of this course it is expected that student will be able to:

- Summarize the theoretical and practical principles of water quality and treatment. Students
- Explain water quality standards, comparison with international standards, water treatment methods for drinking.
- Discuss the water quality as a local problem through field survey to the purification plants, performing the purification methods practically in the lab

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	describe the chemical compositions of natural waters, and explain how and why these compositions vary.	
1.2	Identify water quality criteria and standards.	
1.3	Define the proper water treatment methods for different types of contamination.	
1.4	Recognize the importance of water quality mentoring	
2	Skills :	
2.1	Demonstrate the proper use of analysis method for different water quality parameters	
2.2	Recognize the standard methods for water quality parameters sampling and analysis	
2.3	Write water quality reports	
3	Competence:	
3.1	Interpret and present results	
3.2	Conduct selected water quality parameters experiments	

C. Course Content

No	List of Topics	Contact Hours
1	Water quality concept	6
2	Water quality criteria and standards	8
3	Water treatment	10
4	Water quality monitoring	8
5	Water sampling and analysis	10
Total		

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	describe the chemical compositions of natural waters, and explain how and why these compositions vary.	- Lectures and active discussion. - Explanation and examples	- In class short quizzes - Midterm and final exams

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	Identify water quality criteria and standards.	- Lectures and active discussion. - Explanation and examples	- In class short quizzes - Midterm and final exams
1.3	Define the proper water treatment methods for different types of contamination.	- Lectures and active discussion. - Explanation and examples	In class short quizzes - Midterm and final exams -homework assignments
1.4	Recognize the importance of water quality mentoring	- Lectures and active discussion. - Explanation and examples - reading assignments	In class short quizzes - Midterm and final exams -homework assignments
2.0	Skills		
2.1	Demonstrate the proper use of analysis method for different water quality parameters.	- Lectures and active discussion. - Explanation and examples - reading assignments -case studies	- In class short quizzes - Midterm and final exams -homework assignments
2.2	Recognize the standard methods for water quality parameters sampling and analysis	- Lectures and active discussion. - Laboratory experiments	- In class short quizzes - Midterm and final exams -homework assignments
2.3	Write water quality reports	- Lectures and active discussion. - Explanation and examples - reading assignments -case studies	- In class short quizzes - Midterm and final exams -homework assignments
3.0	Competence		
3.1	Interpret and present results	- Lectures and active discussion. - Laboratory experiments	- Projects and Presentations - report writing
3.2	Conduct selected water quality experiments	- Lectures and active discussion. - Laboratory experiments	- Projects and Presentations - report writing

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	In class short quizzes	Every other week	10%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
2	Midterm	7 th	15%
3	Homework	2 nd , 6 th , 8 th , 10 th	10%
4	Oral presentations	12 th	10%
5	Reports	11 th	15%
6	Final exam	15 th	40%
7			
8			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice : Office hours for the professor and teaching assistants will be announced every semester. 3 hours a week will be scheduled.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Viessman, W. and Hammer, M. (2005) Water Supply and Pollution Control. 7th ed. Upper Saddle River, NJ: Prentice Hall, USA. ISBN 13: 9780131409705.
Essential References Materials	American water works association (AWWA). (2005) Water Treatment Plant Design. AWWA, USA
Electronic Materials	Class presentations and materials will be posted on the course website
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom Water laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Surveys
Quality of learning resources	Peer reviewer	Consultation
Extent of achievement of course learning outcomes	Program leaders	Exit exam results

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	April, 2021