

# **Course Specifications**

<b>Course Title:</b>	إدارة المخلفات الخطرة Hazardous Waste Management	
Course Code:	ENS 464	
Program:	<b>Environmental Sciences and Technology Program</b>	
Department:	Environmental Sciences	
College:	Faculty of Meteorology, Environment and Arid Land Agriculture	
Institution:	King Abdulaziz University	







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# **A. Course Identification**

1. Credit hours: 3 h				
2. Course type				
a.   University   College   Department   x   Others				
b. Required x Elective				
3. Level/year at which this course is offered: 7 <sup>th</sup> Level / 3 <sup>th</sup> Year				
4. Pre-requisites for this course (if any): ENS 362				
5. Co-requisites for this course (if any): None				

#### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	<b>Contact Hours</b>	Percentage
1	Traditional classroom		
2	Blended		60%
3	E-learning		40%
4	Correspondence		
5	Other		

#### 7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contac	t Hours	
1	Lecture	45 h
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	45 h
Other 2	Learning Hours*	
1	Study	
2	Assignments	
3	Library	
4	Projects/Research Essays/Theses	
5	Others (specify)	
	Total	

\* 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		
1 Topics to be Covered		
Torio	No of Weeler	Contract hours
Горіс	<b>NO OF WEEKS</b>	Contact nours

Reviewing regulations related to hazardous waste management	1	3	
Methods of identifying hazardous waste	1	3	
Analysis of physical, chemical, and biological characteristics of hazardous waste	3	9	
Hazardous waste collection and transportation	3	9	
Physical, chemical, and biological treatment methods	2	6	
Disposal method of hazardous waste	3	9	
Recycling and energy recovery	2	6	
	15	45	

#### 2. Course Main Objective

At the end of this course it is expected that students will be able to list regulations related to hazardous waste management, explain hazardous waste identification methods, summarize hazardous waste physical, chemical, and biological characteristics analysis methods, and outline hazardous waste collection, transportation, treatment, recycling and energy recovery, and disposal methods.

#### **3. Course Learning Outcomes**

	CLOs	Aligned PLOs
1	Knowledge:	
1.1	List regulations related to hazardous waste management.	
1.2	Define hazardous waste identification methods	
1.3	Define hazardous waste physical, chemical, and biological characteristics analysis methods.	
1		
2	Skills :	
2.1	Design methods for hazardous waste collection, transportation, treatment, recycling and energy recovery, and disposal.	
2.2	Judge problems in hazardous waste management.	
2.3	Selection the suitable management method	
2		
3	Competence:	
3.1	Judge independently and as part of a team.	
3.2	Use resources and time with other members of the group.	
3.3	Show results of work to others.	
3		

#### **C.** Course Content

No	List of Topics	Contact Hours
1	Reviewing regulations related to hazardous waste management	3
2	Methods of identifying hazardous waste	3

3	Analysis of physical, chemical, and biological characteristics of	9
3	hazardous waste	
4	Hazardous waste collection and transportation	9
5	Physical, chemical, and biological treatment methods	6
6	Disposal method of hazardous waste	9
7	Recycling and energy recovery	6
8		
9		
	Total	45h

# **D.** Teaching and Assessment

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

Code	de Course Learning Outcomes		Teaching Strategies	Assessment Methods	
1.0	Knowledge				
1.1	list, name, record, define, label, outline, state,	•Involvement of students in active discussion about topics.		<ul> <li>In class short quizzes.</li> <li>Midterm, and final exams.</li> </ul>	
1.2	describe, recall, memorize, reproduce, recognize, record, tell, write	<ul> <li>Providing an opportunity for students to apply what they learn in the classroom to real-life experiences.</li> <li>Homework assignments.</li> </ul>		<ul><li>In class short quizzes.</li><li>Midterm and</li></ul>	
2.0	Skills				
2.1	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct,	• Hom • Prob • Labo	ework assignments lem solving. oratory experiments.	<ul> <li>In class short quizzes</li> <li>Midterm, practical, and final exams</li> <li>Checking the problems solved in the homework assignments.</li> <li>In class short quizzes</li> <li>Midterm practical and</li> </ul>	
2.2	predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise	<ul> <li>Homework assignments</li> <li>Problem solving.</li> <li>Laboratory experiments.</li> </ul>		<ul> <li>Materm, practical, and final exams</li> <li>Checking the problems solved in the homework assignments.</li> </ul>	
3.0	Competence				
3.1	demonstrate, judge, choose, illustrate modify, show, use, appraise, evaluate justify,	e, 1-W e, 2-S gro	Vriting group reports olving problems in ups.	Grading homework assignments	
3.2	analyze, question, and write	1-Writing group reports 2-Solving problems in groups.		Grading homework assignments	
•••					
2. Asse	2. Assessment Tasks for Students				

#	Assessment task*	Week Due	Percentage of Total Assessment Score
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#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Class activities (in class quizzes, and homework)	Weekly	20%
2	Midterm exam	8	40%
3	Final exam	16	40%
4			
5			
6			
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 6 h/ week

## **F. Learning Resources and Facilities**

#### **1.Learning Resources**

Required Textbooks	<ul> <li>معالجة مياه الصرف الصناعي (٢٠١٠م)، - أحمد السروى- دار الكتب العلمية</li> </ul>
Essential References Materials	Michael D. LaGrega, Phillip L. Buckingham, Jeffrey C. Evans. (2010) Hazardous Waste Management. ISBN-13: 978- 1577666936 ISBN-10: 1577666933 Edition: Reissu
Electronic Materials	Websites on the internet that are relevant to the topics of the course
Other Learning Materials	Computer-based programs/CD, professional standards or regulations and software.

#### 2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture room with max 30 seats
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	AV, data show, Smart Board, software, etc.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Equipment and illustration tools relevant to the course material

# **G.** Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	<b>Evaluation Methods</b>
Strategies for Obtaining Student Feedback on Effectiveness of Teaching	<ul><li>Course evaluation by student</li><li>Students- faculty meetings</li></ul>	Direct
Strategies for Evaluation of Teaching by the Program/Department Instructor	<ul> <li>Departmental council discussions</li> <li>Discussions within the group of faculty teaching the course</li> </ul>	Direct
Processes for Improvement of Teaching	<ul> <li>Attending workshops given by experts on the teaching and learning methodologies.</li> <li>Periodical departmental revisions of its methods of teaching</li> </ul>	Direct
Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)	Providing samples of all kind of assessment in the departmental course portfolio of each course	Direct, Indirect
Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.	<ul> <li>The course material and learning outcomes will be periodically reviewed and the changes to be taken are approved in the departmental and higher councils.</li> <li>The head of department and faculty take the responsibility of implementing the proposed changes.</li> </ul>	Direct, Indirect

**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	Prof. Mohamed Barakat
Reference No.	
Date	April 2021