

Course Description Form of Soil and water pollution

1. Course Name:	
Soil and water pollution	
2. Course Code:	
SOWP307	
3. Semester / Year:	
first semester/ 2024-2025	
4. Description Preparation Date:	
15/1/2025	
5. Available Attendance Forms:	
Full time (theoretical lecture and practical lecture) weekly	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours (2 hours theoretical and 3 hours practical per week) for 14 weeks, number of units 3.5 units	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Alaa Hasan Fahmi Email: alaahfahmi@uodiyala.edu.iq Abtehal Mohammed Abed	
8. Course Objectives	
Course Objectives: Graduating students who are able to:	1-Introducing the student to the concept of soil and water pollution 2 -Introducing the ecosystem and its types , 3 -Definition of pollution - its causes and sources 4 -Identify the cycles of elements and their impact on environmental pollution, then identify water pollution, including surface and groundwater pollution 5 -Identify bacterial and virus water pollution, industrial water pollutants and pesticide behavior in the water environment , 6- Identify soil pollution such as biological soil pollution, soil pollution with pesticides, and biodegradation of pesticides in the soil

9. Teaching and Learning Strategies

Strategy	In-person lectures for 14 weeks, including two monthly exams, daily exams, and scientific reports
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10. Course Structure

Theoretical part

Week	Hours	Required learning outcomes	Unit or Subject	Learning Method	Evaluation Method
1	2	To explain to the student the ecosystem and the definition of pollution, its causes and sources	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
2	2	To familiarize the student with the cycles of elements (nitrogen, phosphorus, oxygen, carbon, and sulfur)	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
3	2	The student should recognize surface, groundwater and Seawater pollution.	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
4	2	The student should recognize bacterial and viruses water contamination and worms.	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
5	2	The student should be acquainted with the industrial pollutants of water, battery, and fertilizer factories	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
6	2	Semester First exam	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
7	2	The student should be familiar with the behavior of pesticides in the water environment. The behavior of pesticides on .water organisms	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
8	2	To familiarize the student with biological pollution, sewage waste , fertilization effect on water pollution	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports

9	2	The student should know the table use of water according to its properties for different uses	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
10	2	Biological soil pollution: Pollution by urban waste, effluents, solid waste, waste Hospitals (Satisfactory)	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
11	2	Pesticide contamination of soil: pesticide behavior in different types of soil, biodegradation of pesticides in soil and factors affecting the rate of breakdown, physical factors that control inhibition of pesticide action	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
12	2	Soil contamination with heavy metals: sources of heavy metals, toxicity of heavy metals, soil and water pollution standards: - concentration of heavy metals, pollution index, pollution factor, ground accumulation index, pollution load index, enrichment factor	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
13	2	To familiarize the student with global warming, Ozone layer, heat pollution, radioactive pollution	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports
14	2	Semester second exam	Soil and water pollution	Lecture Dialogue & discussion Brainstorming	Daily, monthly and final exams and daily reports

Practical part

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Identify the equipment and tools used in measuring pollution	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
2	3	Environmental pollution, sources of pollution, factors affecting water	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports

		quality, water and soil chemical properties.			
3	3	Water pollutants, pollution with chloride salts NaCl, measurement of soil salinity and water	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
4	3	Acidity and alkalinity of water, methods of measuring total acidity in water and soil	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
5	3	Alkalinity in water and soil, alkalinity measurement methods of CaCO ₃	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
6	3	Measurement of free carbon dioxide in water (dissolved), measurement of chlorine in water	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
7	3	Measurement of hardness in water, total hardness, calcium hardness Magnesium hardness in water	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
8	3	Dissolved oxygen in water	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
9	3	Measurement of bio oxygen requirements BOD	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
10	3	Organic matter dissolved in water	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
11	3	Microbial contamination of soil and water	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
12	3	Methods for measuring pesticide residues in soil, water and plant The effect of pesticides on soil microorganisms, measurement methods and recognition of devices	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
13	3	The effect of some pesticides on the revival of displaced soil, especially economic soil	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports
14	3	Measurement of the concentration of certain toxic elements and	Soil and water pollution	Observation Dialogue & discussion	Daily, monthly and final exams and daily reports

		methods of assessing their hazards			
11. Course Evaluation					
Examination Monthly & daily exams with discussion questions inside the lecture. The degree of participation in the questions related to the subject.					
12. Learning and Teaching Sources					
Required Textbooks (Curricular Books, If Any)			Environmental pollution – 2013. Faleh Hasan Ahmed and Baha Abd Aljabar- University of Baghdad		
Main References (Sources)			Environmental pollution – 2013. Faleh Hasan Ahmed and Baha Abd Aljabar- University of Baghdad		
Recommended Books and References (Scientific Journals, Reports...)			Iraqi academic Journal		
Electronic References, Websites			Soil Science Society of America Library Genesis		